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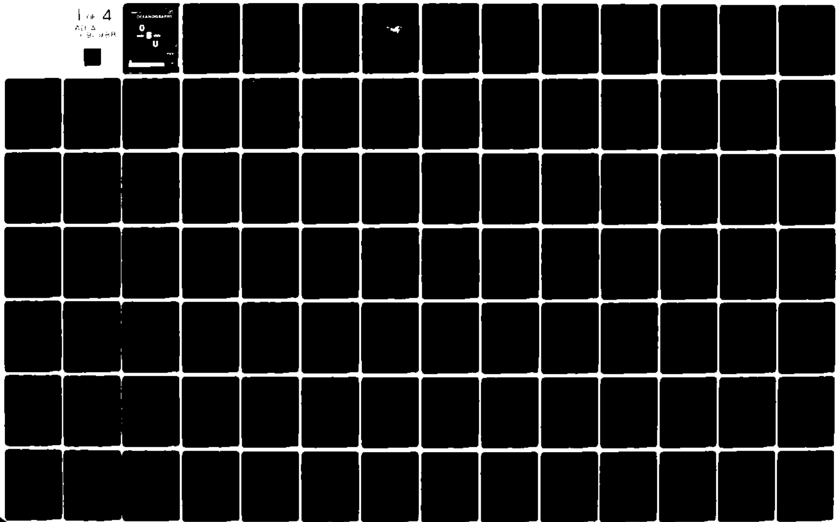

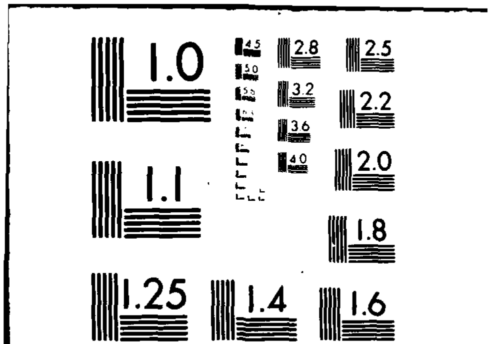

MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU

HYDROGRAPHIC, OPTICAL, AND BIOLOGICAL OBSERVATIONS ON THE CENTRAL OREGON SHELF DURING 6-13 NOVEMBER 1977

Department of Energy Contract No. EY-76-S-06-2227
and
Office of Naval Research Contract N00014-76-~~8067~~ C-0067

by

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Ross Heath
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SCHOOL OF OCEANOGRAPHY

OREGON STATE UNIVERSITY

INTRODUCTION

During the W7711A cruise, from November 5 through November 13, 1977, a series of measurements were made on the hydrography, suspended particulate matter (spm), nutrients, first and second trophic level biomasses, primary productivity and zooplankton species for the purpose of gaining concurrent winter time information on these parameters. The cruise was organized by combining five days of ONR ship time with four days of DOE ship time. The experimental area for this winter cruise was selected from those areas in which we had a great deal of summertime information and in which the general bottom topography is smooth and simple (within latitudes 44°-40.0'N to 45°20'N).

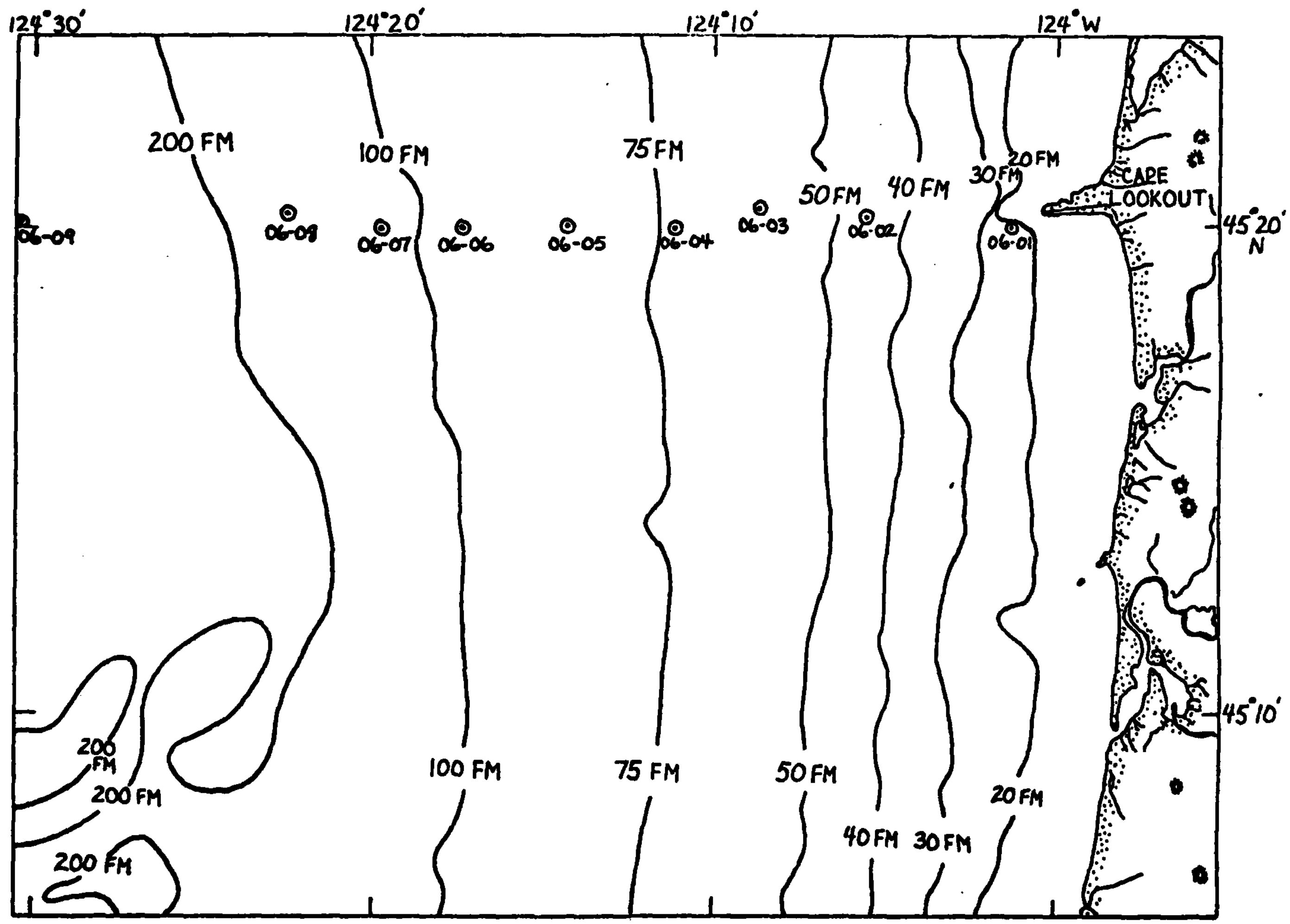
P-1

CRUISE NARRATIVE

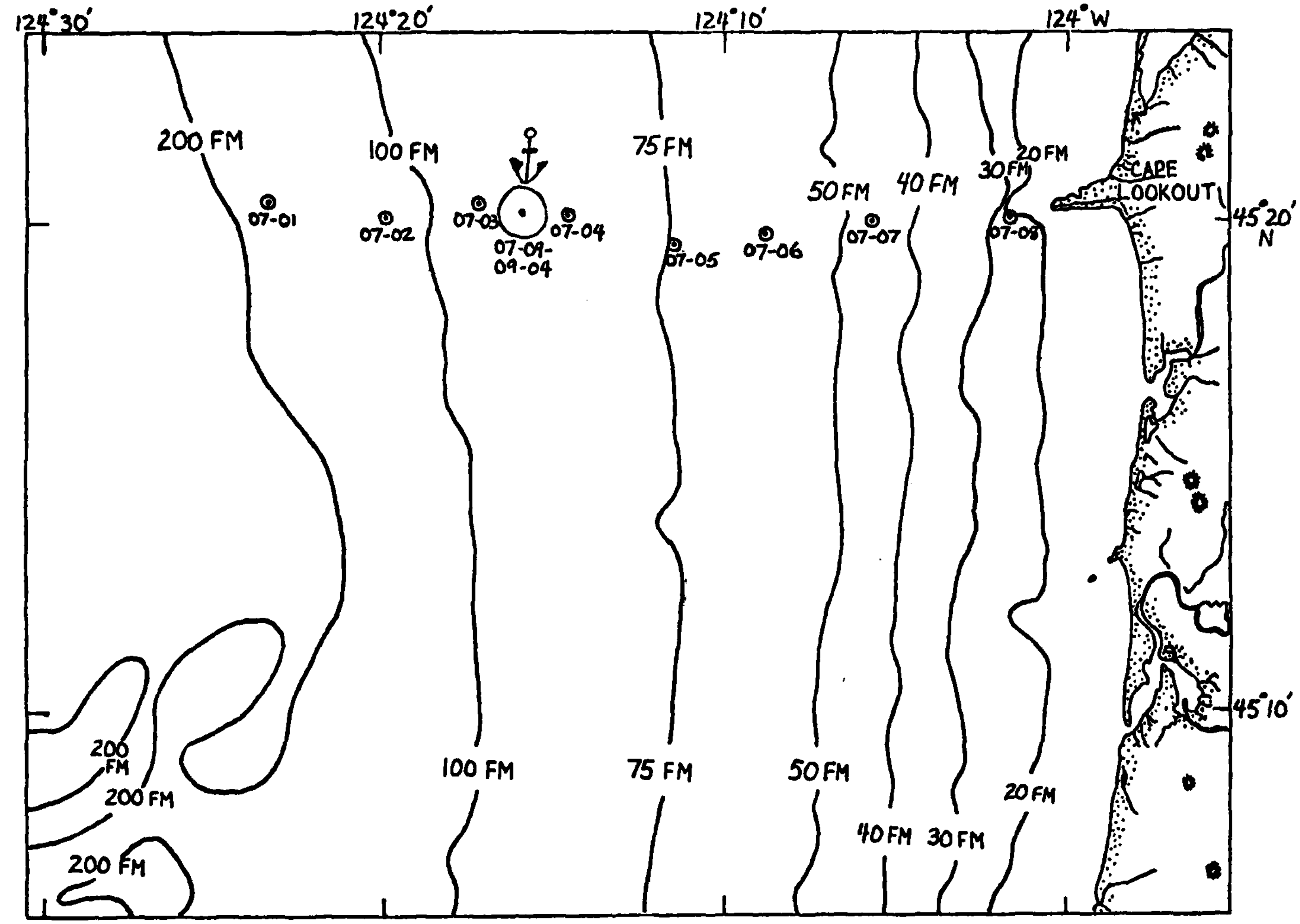
A series of stations were selected along 45°20'N latitude nominally at 1, 3, 5, 7, 9, 11, 13, 15 and 20 n.m. from Cape Lookout (see following pages for maps). A rapid transect was run (station 6-1 to 6-8) with no water samples being taken. These stations were then repeated (Station 6-9 to 7-8) with rosette water samples taken at twelve depths selected to represent the surface euphotic layer and the deeper layers of clean and turbid water as determined by real-time plots of the beam transmission and temperature structure. A time series was then taken with 36 hours of replicate casts 10 n.m. offshore (Station 7-9 to 9-4). The transect was repeated twice taking rosette samples (Station 9-5 to 10-3 and Station 10-4 to 11-1). A second time series station was then occupied 14 n.m. offshore (station 11-2 to 13-1). Finally, a rapid transect, with no rosette samples, was taken along the same 45°20'N line (Station 13-2 to 13-10) followed by a short rapid transect ten miles to the south with stations at 1, 3, 5, 7 and 9 n.m. offshore.

Weather conditions during the cruise were very severe; two well-developed storms accompanied by gusts exceeding 40 kts passed through the area forcing temporary suspension of sampling at the 14 n.m. time series station from 0400 to 1900 November 11 and from 0500 November 12 to 0130 November 13. Our measurements were made under very rough winter storm conditions, conditions in which direct field measurements were previously lacking.

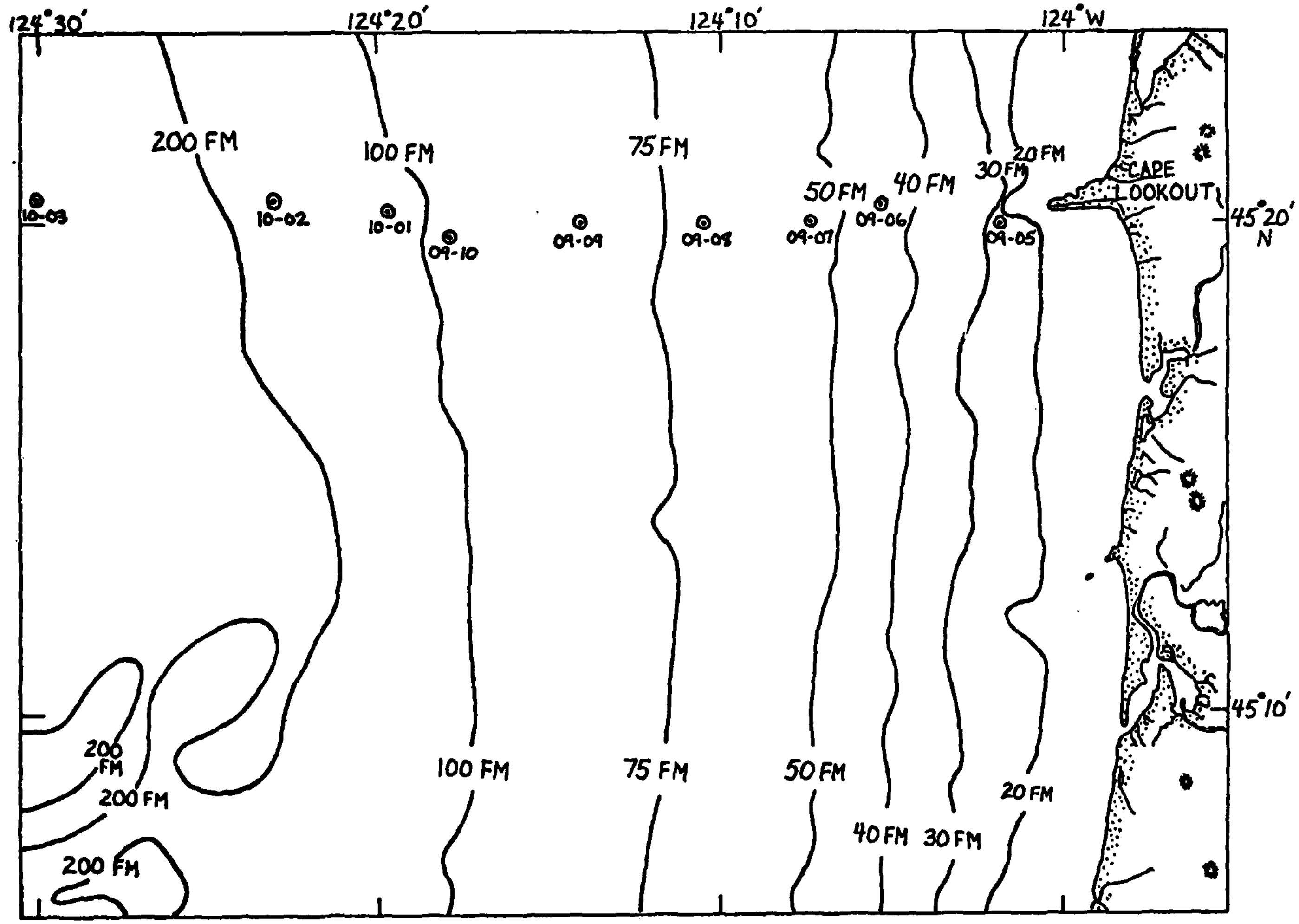
Procedures and methods of observations including instruments, their calibraiton, and data reduction are described in separate sections under each parameter along with the corresponding data.



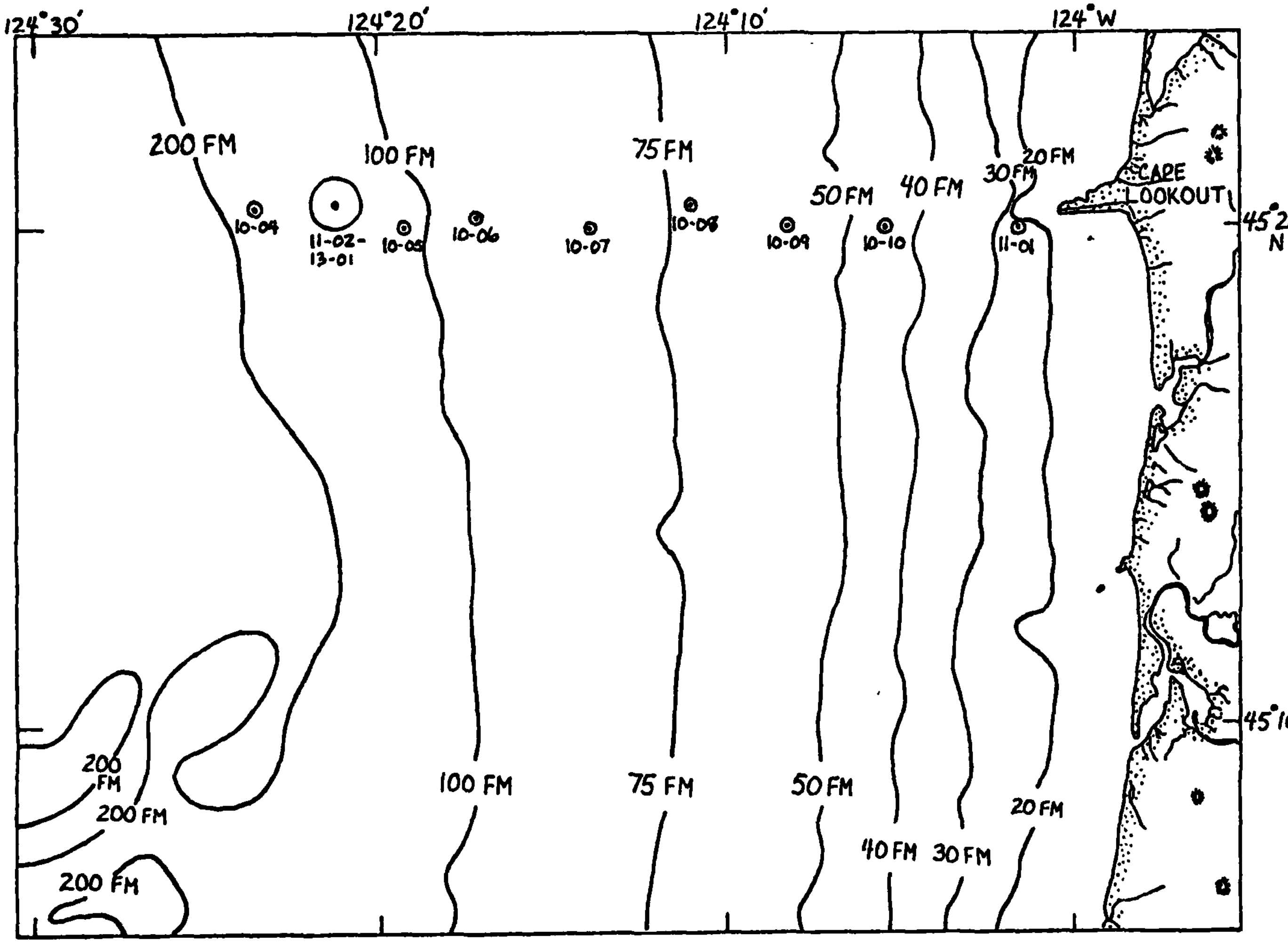
W7711A First transect station locations



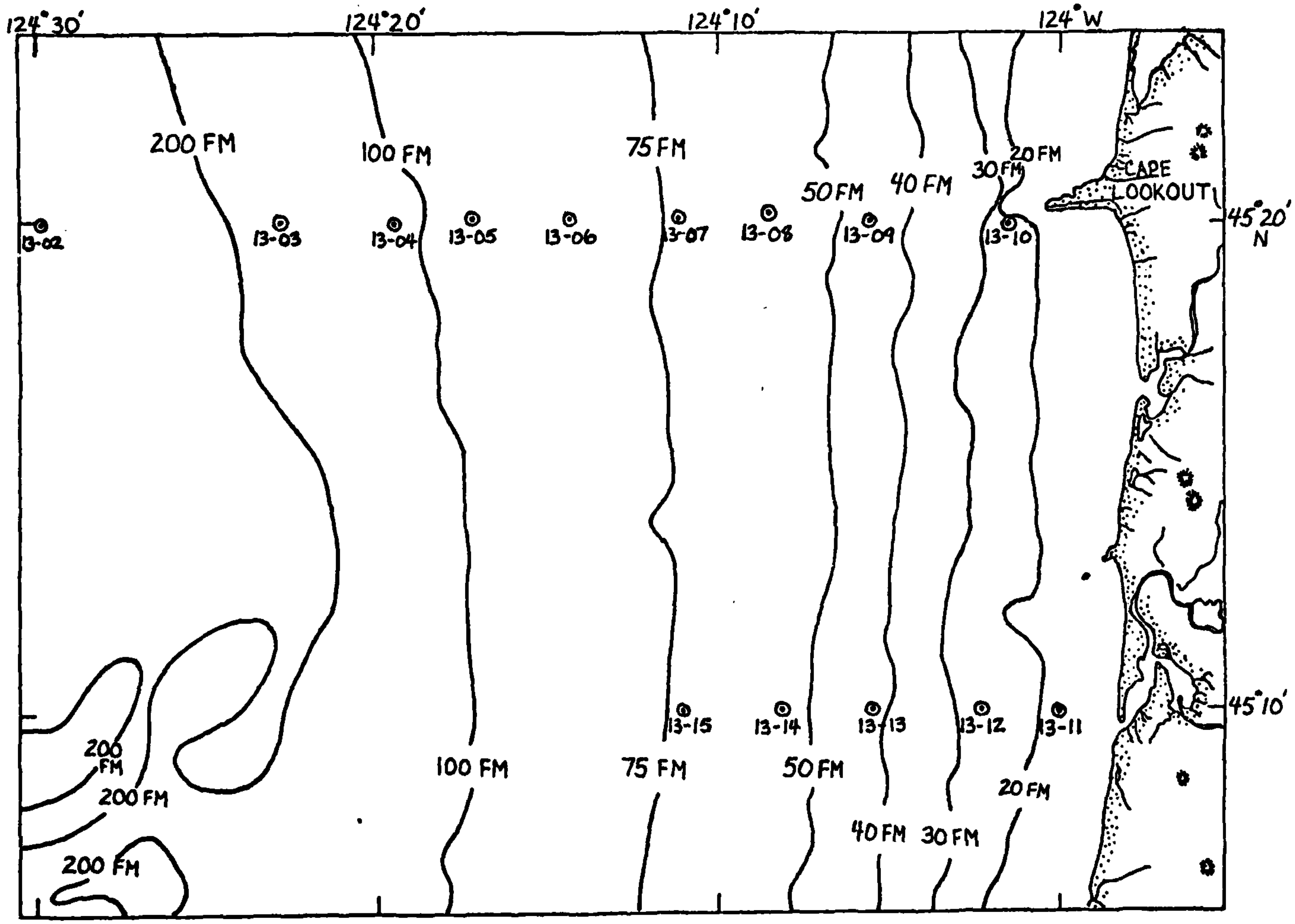
W7711A Second transect and 10 nm time series station locations



W7711A Third transect station locations



W7711A Fourth transect and 14 nm station locations



W7711A Fifth transect and southern transect station locations

HYDROGRAPHIC AND TRANSMISSION DATA

HYDROGRAPHIC AND TRANSMISSION DATA

Hydrographic data on cruise W7711A was collected with a CTD designed and built by the OSU optics group. Analog values proportional to temperature, pressure, and conductivity are input to a data logging package which records digitized data on a cassette tape. Real time data was obtained by using several voltage controlled oscillators (VCO) in the data logger package to produce FM multiplexed signals up the conductive cable. Decoding these signals at the surface allowed plotting of temperature, pressure, and light transmission and allowed for the intelligent choice of sampling depths for the attached rosette sampler which held twelve 5 l sample bottles.

The data logging system sampled once per two seconds. The range of the pressure sensor was 450 psi (ca. 300M) and with the 12 bit converter, one part in 4096 equals a resolution of 8 cm. The temperature probe was calibrated for a range of -1 to 28°C with a resolution of 0.01°C. The conductivity sensor is temperature compensated and has a range of 0 to 65 mmho and resolution of 0.02 mmho. Overall system error is estimated to be 0.4 M, 0.04°C, and 0.07% salinity.

A beam transmissometer designed and built by the OSU optics group measures the transmission of red light (660 nm) through a 1 M folded path. This instrument is designed to be insensitive to dissolved organic matter, changes in ambient light and temperature, but highly sensitive to suspended particulate material. A thorough description of the electronics and theory of operation is found in Bartz, Zaneveld and Pak (1978). This instrument is also interfaced to the data logger and VCO. Range is 0 to 100% transmission with a resolution of 0.025% and accuracy of 0.1%. The instrument is calibrated by setting the value in air to the theoretical value of 87.1% which is computed for 660 nm light losses at the various optical interfaces.

On several casts an irradiance probe to determine the submarine light field was interfaced to the data logger. Because of problems with this sensor on some casts and its removal on many, this data is not included in this data report.

Bartz, Robert, J. Ronald V. Zaneveld and Hasong Pak, 1978. A Transmissometer for Profiling and Moored Observations in Water. SPIE Vol. 160, Ocean Optics V. 1978.

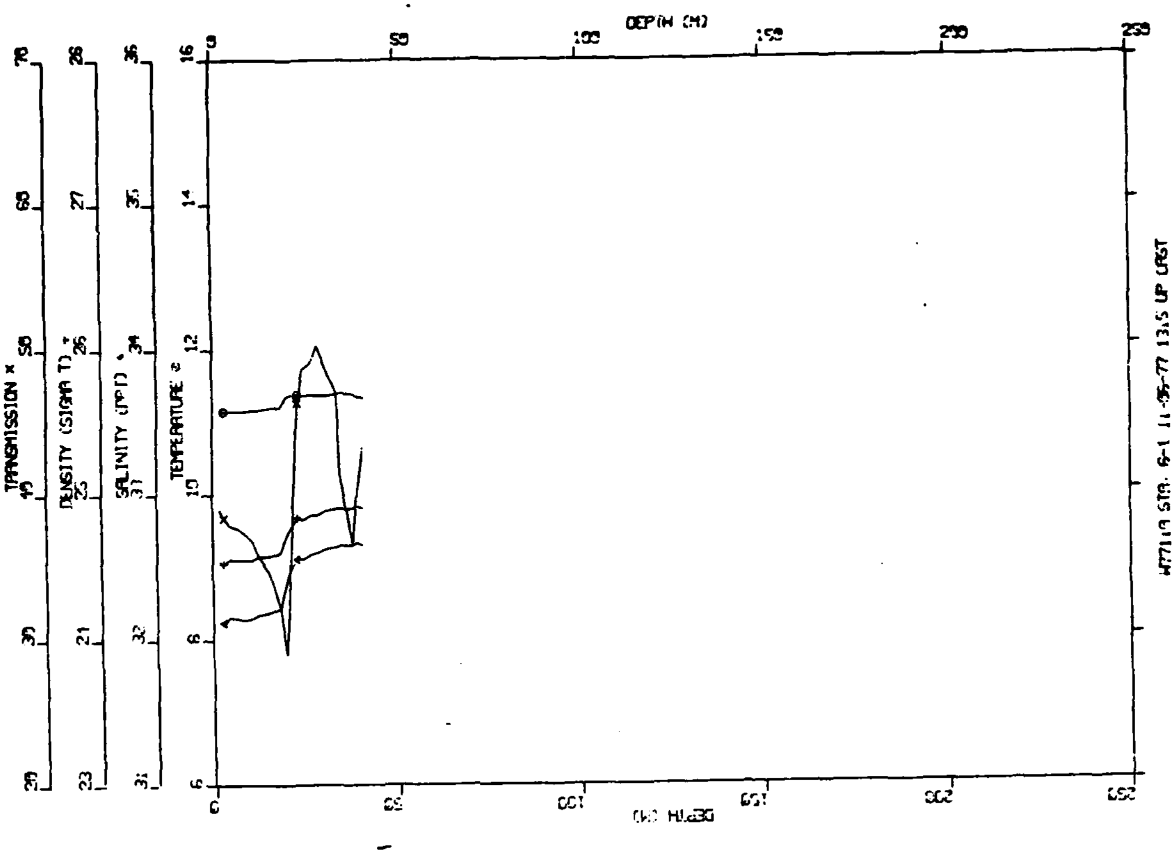
Data Processing

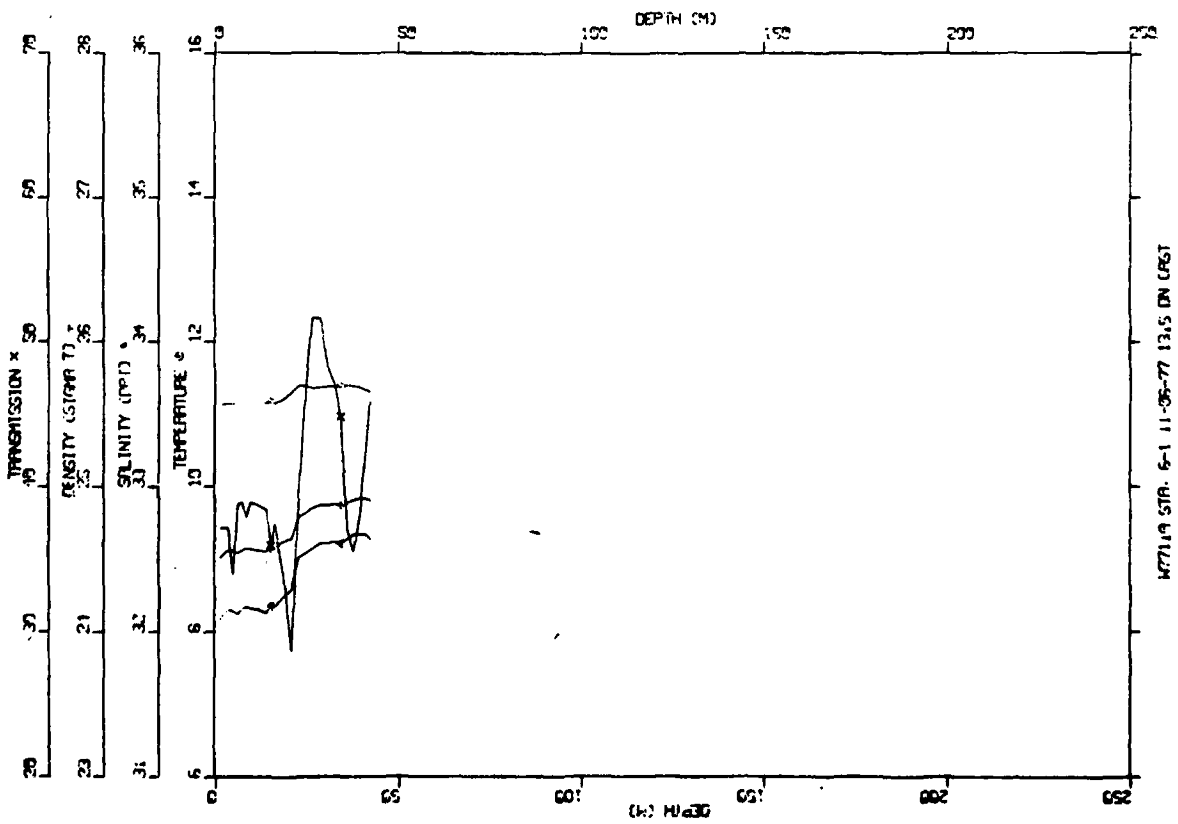
The cassette tapes were processed on a PDP 8/L computer system after the cruise. Standard equations were used for computing salinity and density (sigma-T) at depth changes of 1 meter. This data set was then edited to remove grossly erroneous points and plotted in the following figures. Both the down cast and up cast are shown for each station with the station time being the start of down cast time (Pacific Standard Time). The temperature trace on the up casts of some stations has been modified by adding 2C° spikes to the trace to indicate the depths at which rosette water samples were taken. Samples were always taken at the greatest depth reached but this sampling was not usually indicated on the plot.

Standard depth values are listed for each station on the page facing each plot. These values were obtained by appling a 3 point smoothing function to the data used in each down cast plot and then linearly interpolating to the desired standard depth.

W7711A STA 6-1 11-06-77 1315 DN CAST

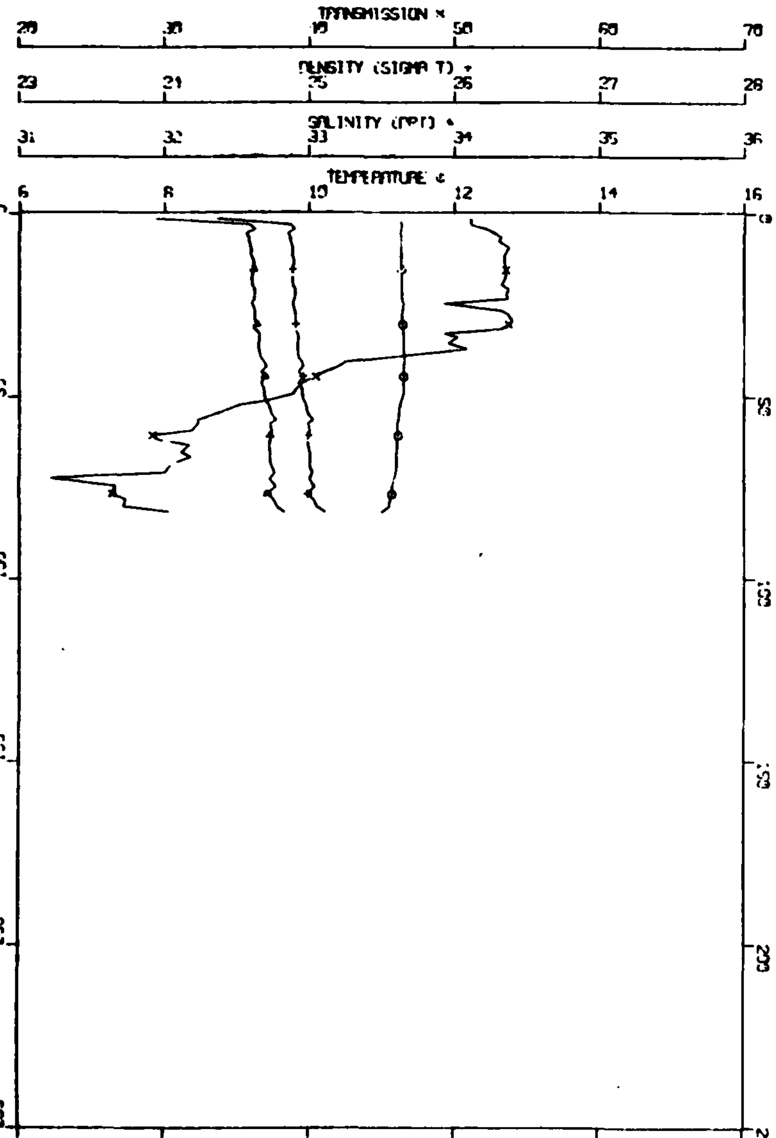
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.15	32.14	24.55	35.98
10.0	11.14	32.16	24.57	38.60
15.0	11.16	32.17	24.57	37.04
20.0	11.28	32.31	24.66	32.91
25.0	11.38	32.55	24.83	47.05
30.0	11.38	32.61	24.87	49.53
35.0	11.39	32.63	24.89	40.94
40.0	11.36	32.67	24.92	40.13
42.1	11.33	32.65	24.91	44.98


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE

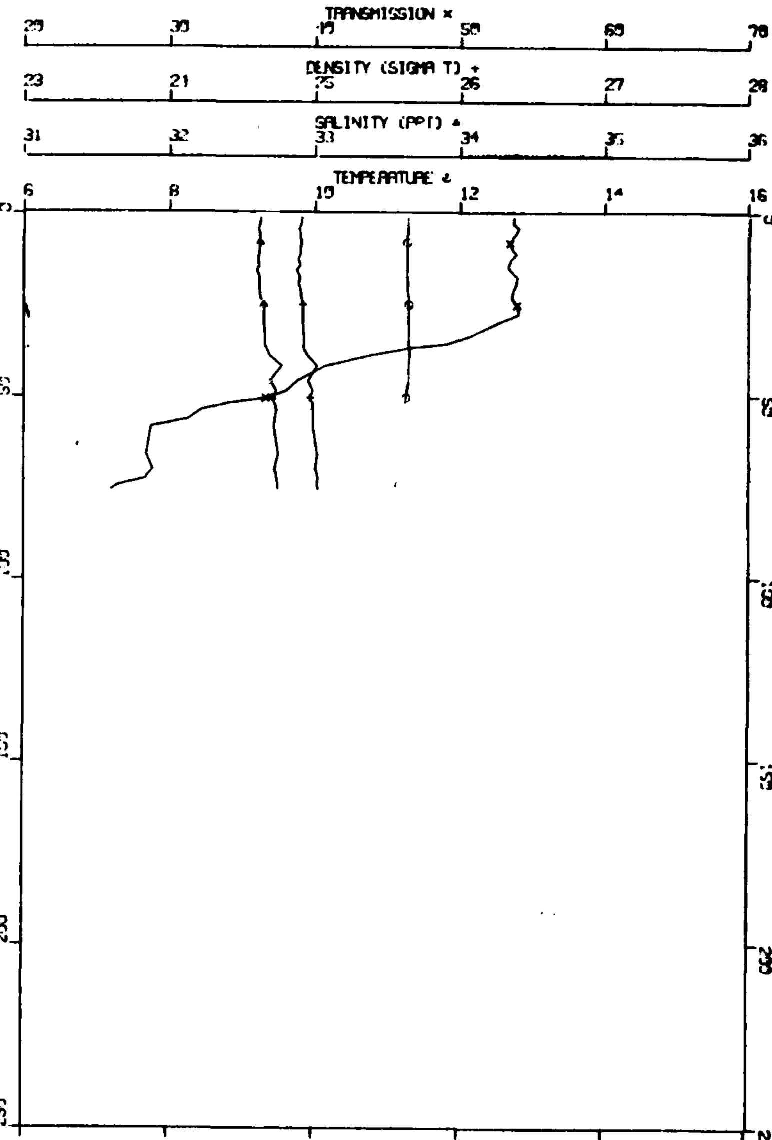

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE

W7711A STA 6-2 11-06-77 1400 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.27	32.60	24.89	52.51
10.0	11.28	32.60	24.89	53.52
15.0	11.28	32.62	24.89	53.52
20.0	11.28	32.63	24.91	53.55
25.0	11.29	32.62	24.90	51.78
30.0	11.29	32.63	24.91	53.76
35.0	11.30	32.65	24.92	50.05
40.0	11.32	32.68	24.94	44.03
45.0	11.30	32.69	24.95	40.12
50.0	11.29	32.70	24.96	37.94
60.0	11.22	32.74	25.00	30.62
70.0	11.20	32.75	25.01	29.31
80.0	11.08	32.79	25.06	28.02
81.5	11.03	32.82	25.10	29.51



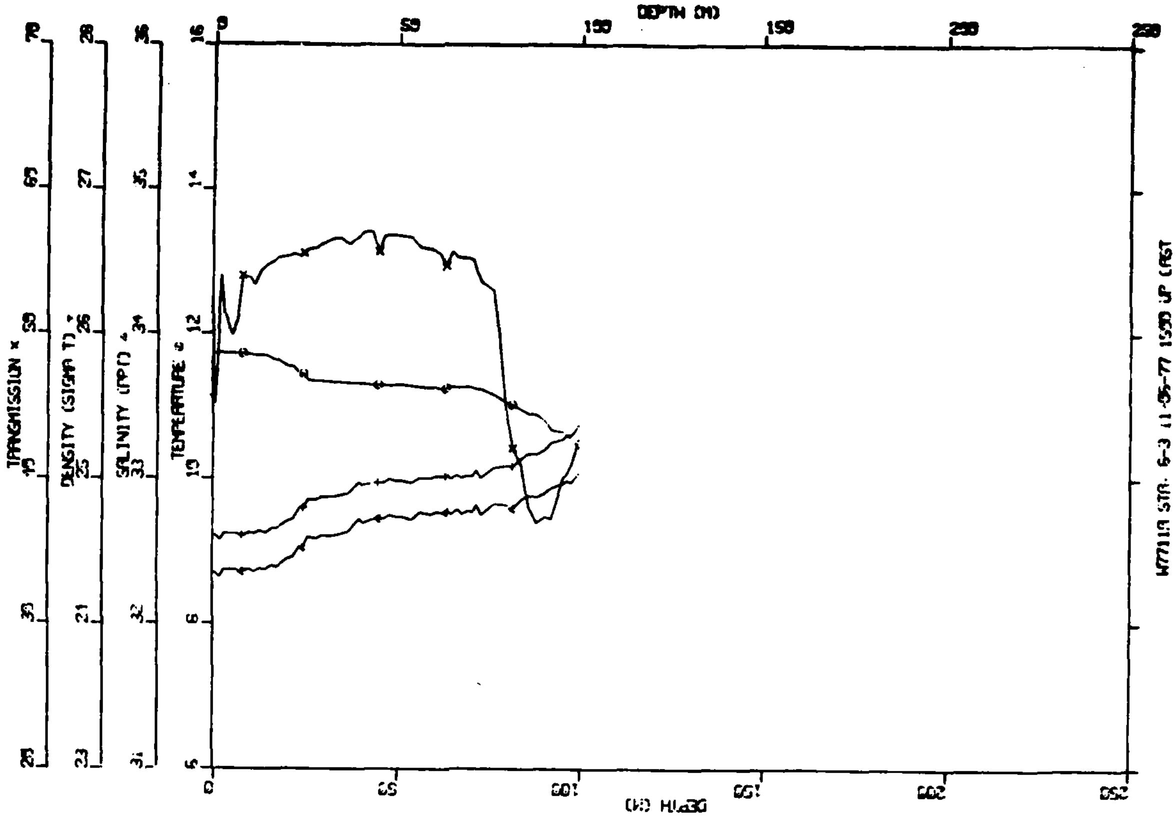
W7711A STA. 6-2 11-06-77 1439 DN CAST

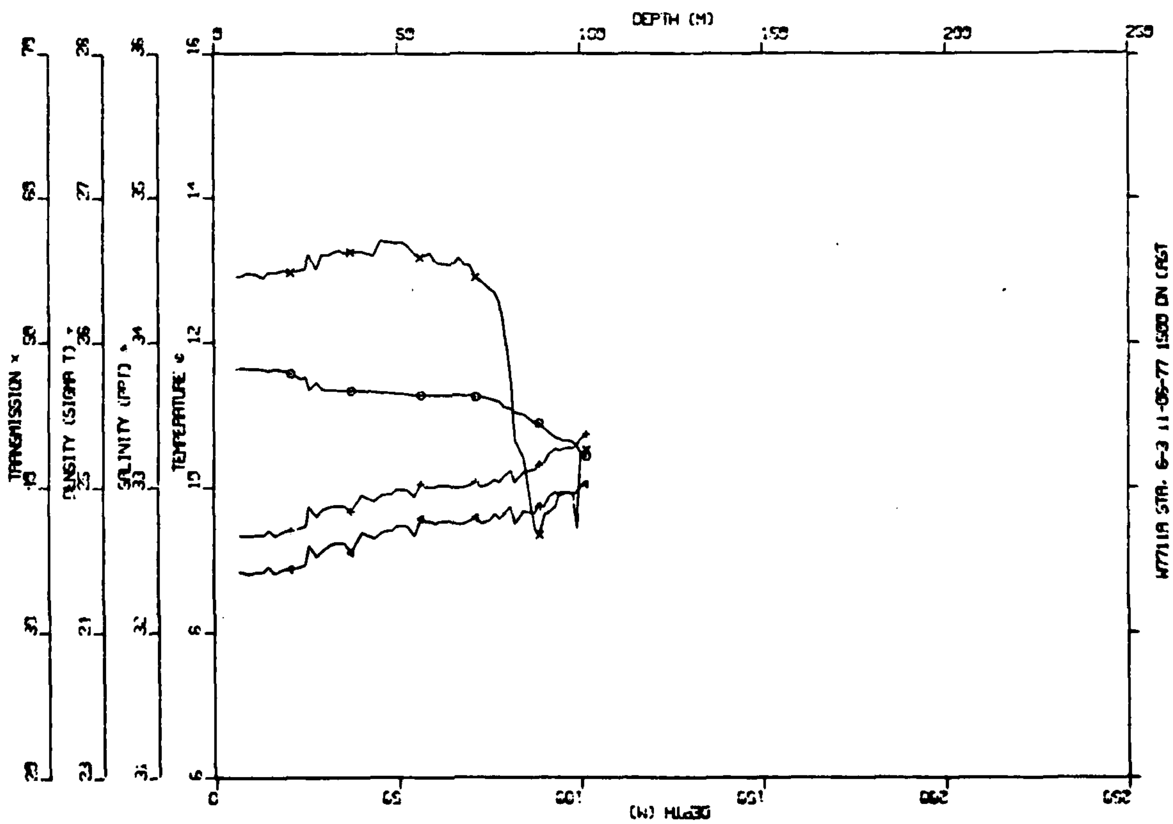


W7711A STA. 6-2 11-06-77 1450 UP CAST

W7701A STA 6-3 11-06-77 1500 DN CAST

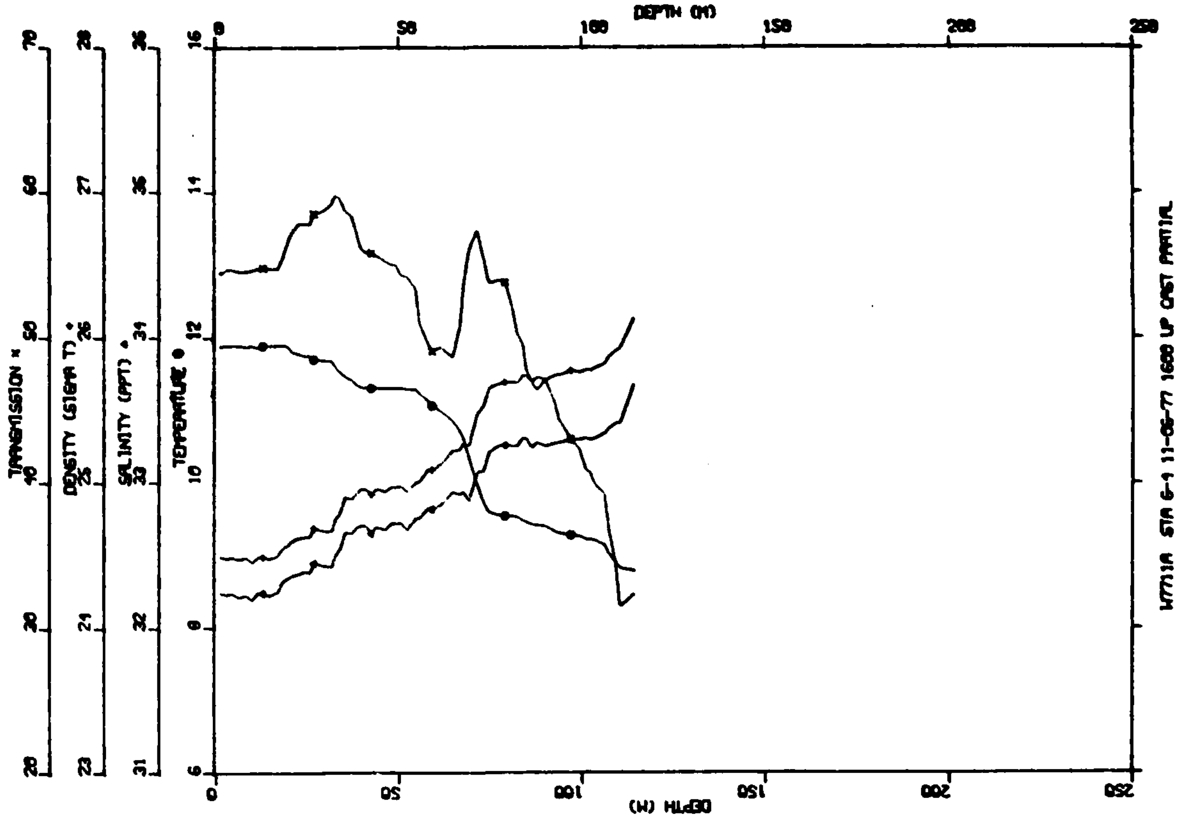
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.65	32.42	24.68	54.70
10.0	11.64	32.41	24.67	54.77
15.0	11.63	32.44	24.69	54.77
20.0	11.59	32.44	24.71	54.93
25.0	11.46	32.52	24.79	55.43
30.0	11.38	32.58	24.85	55.92
35.0	11.34	32.61	24.87	56.31
40.0	11.34	32.65	24.91	56.24
45.0	11.32	32.69	24.94	56.69
50.0	11.31	32.73	24.98	56.94
60.0	11.28	32.77	25.01	55.82
70.0	11.27	32.78	25.02	55.09
80.0	11.11	32.83	25.09	48.55
90.0	10.83	32.89	25.19	37.79
100.0	10.50	33.01	25.34	41.11
101.4	10.45	33.03	25.36	42.55

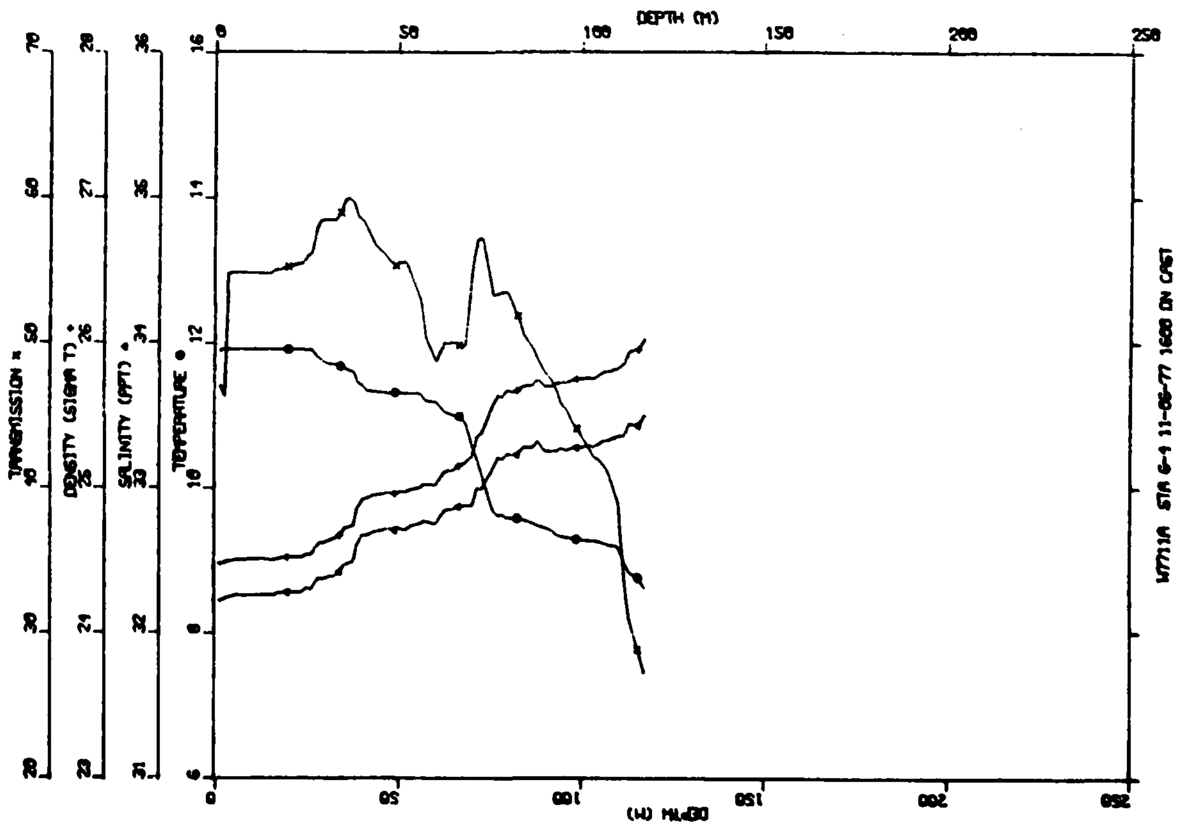

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W7711A STA. 6-3 11-05-77 1500 UP CAST


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W7711A STA. 6-3 11-05-77 1500 DN CAST

W7711A STA 6-4 11-06-77 1600 DN CAST

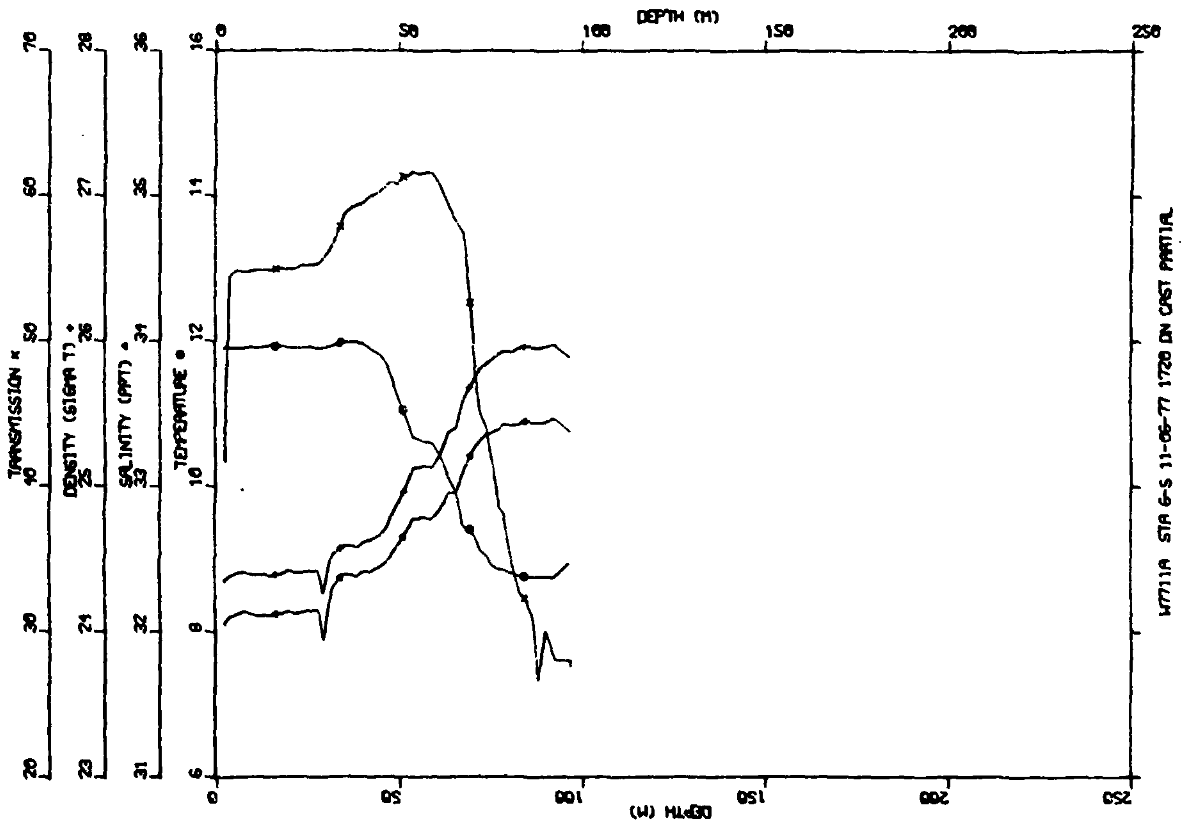
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.91	32.25	24.50	53.88
10.0	11.91	32.26	24.51	54.83
15.0	11.91	32.26	24.50	54.85
20.0	11.91	32.28	24.52	55.26
25.0	11.90	32.30	24.54	56.00
30.0	11.74	32.38	24.63	58.43
35.0	11.65	32.46	24.71	59.61
40.0	11.40	32.66	24.91	58.35
45.0	11.32	32.71	24.96	56.44
50.0	11.31	32.72	24.97	55.50
60.0	11.16	32.78	25.05	49.49
70.0	10.62	32.91	25.24	54.20
80.0	9.59	33.22	25.66	53.14
90.0	9.45	33.27	25.71	47.99
100.0	9.28	33.28	25.75	43.44
110.0	9.14	33.35	25.83	38.20
117.5	8.65	33.48	26.01	27.66


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ◆
TEMPERATURE ●
W7711A STA 6-4 11-06-77 1600 UP CAST PARTIAL


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ◆
TEMPERATURE ●
W7711A STA 6-4 11-06-77 1600 DN CAST

W77[illegible]1A STA 6-5 11-06-77 1720 DN CAST

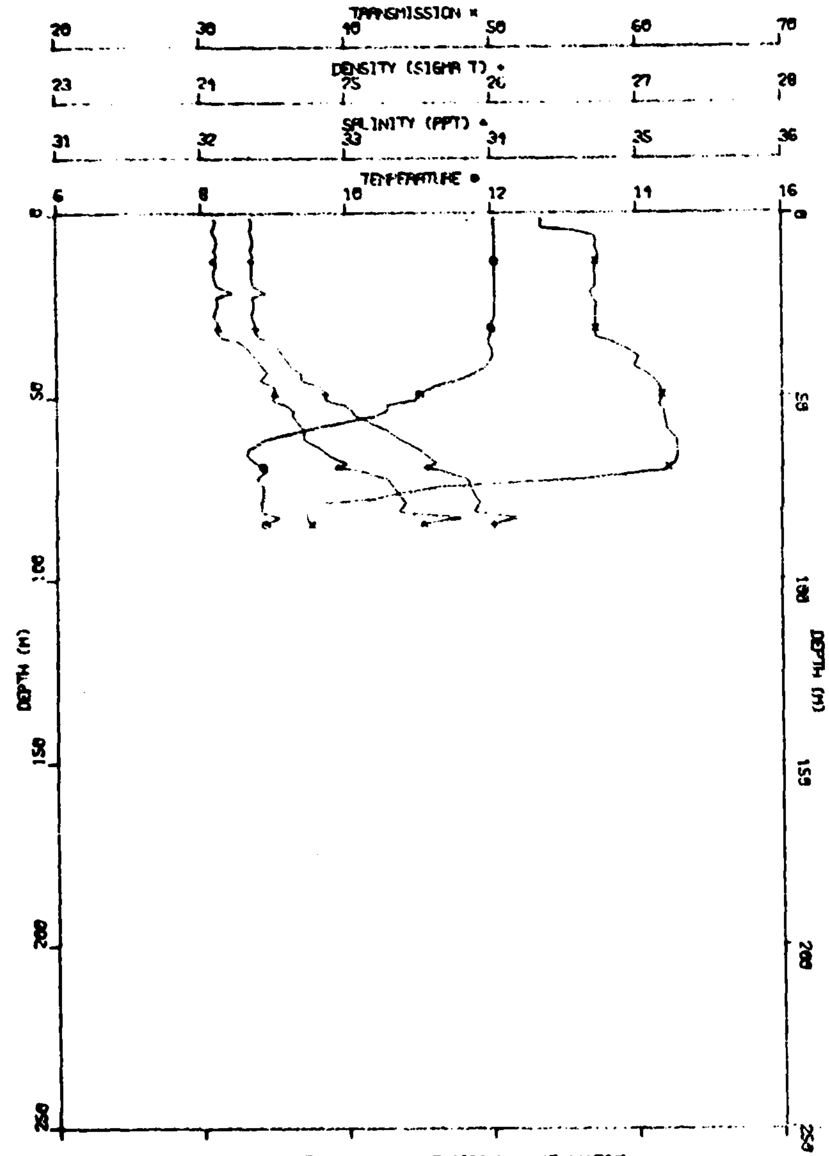
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.91	32.11	24.39	54.75
10.0	11.92	32.12	24.40	54.83
15.0	11.93	32.11	24.39	54.88
20.0	11.91	32.13	24.41	54.97
25.0	11.91	32.14	24.41	55.21
30.0	11.93	32.13	24.41	56.14
35.0	11.98	32.39	24.59	58.64
40.0	11.95	32.40	24.61	59.59
45.0	11.79	32.45	24.68	60.38
50.0	11.19	32.61	24.91	61.07
60.0	10.48	32.82	25.20	61.02
70.0	9.32	33.24	25.72	50.24
80.0	8.83	33.42	25.93	35.66
90.0	8.75	33.45	25.96	28.71
100.0	9.09	33.58	26.01	28.30
110.0	9.68	34.67	26.77	30.72
120.0	10.41	36.07	27.73	34.60
118.7	10.68	36.13	27.73	35.51



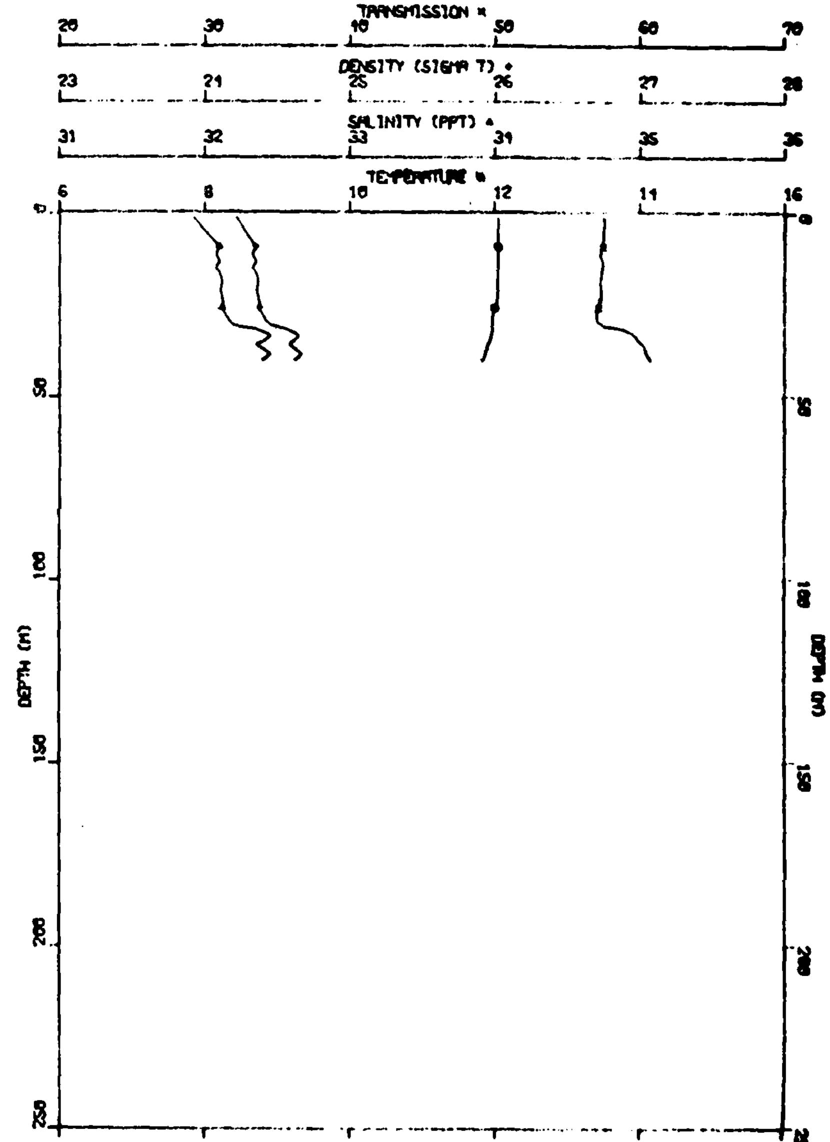
W7711A STA 6-S 11-06-77 1720 DN CAST PARTIAL
DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 6-6 11-06-77 1830 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	12.05	32.09	24.35	56.03
10.0	12.06	32.10	24.35	57.29
15.0	12.05	32.10	24.36	57.20
20.0	12.06	32.15	24.39	57.06
25.0	12.05	32.11	24.36	57.21
30.0	12.03	32.11	24.37	57.22
35.0	11.98	32.26	24.49	58.40
40.0	11.97	32.40	24.60	60.02
45.0	11.57	32.45	24.72	61.08
50.0	10.97	32.52	24.87	61.70
60.0	9.33	32.71	25.30	62.37
70.0	8.86	33.09	25.67	60.99
80.0	8.85	33.40	25.92	38.45
84.9	8.94	33.61	26.06	37.55



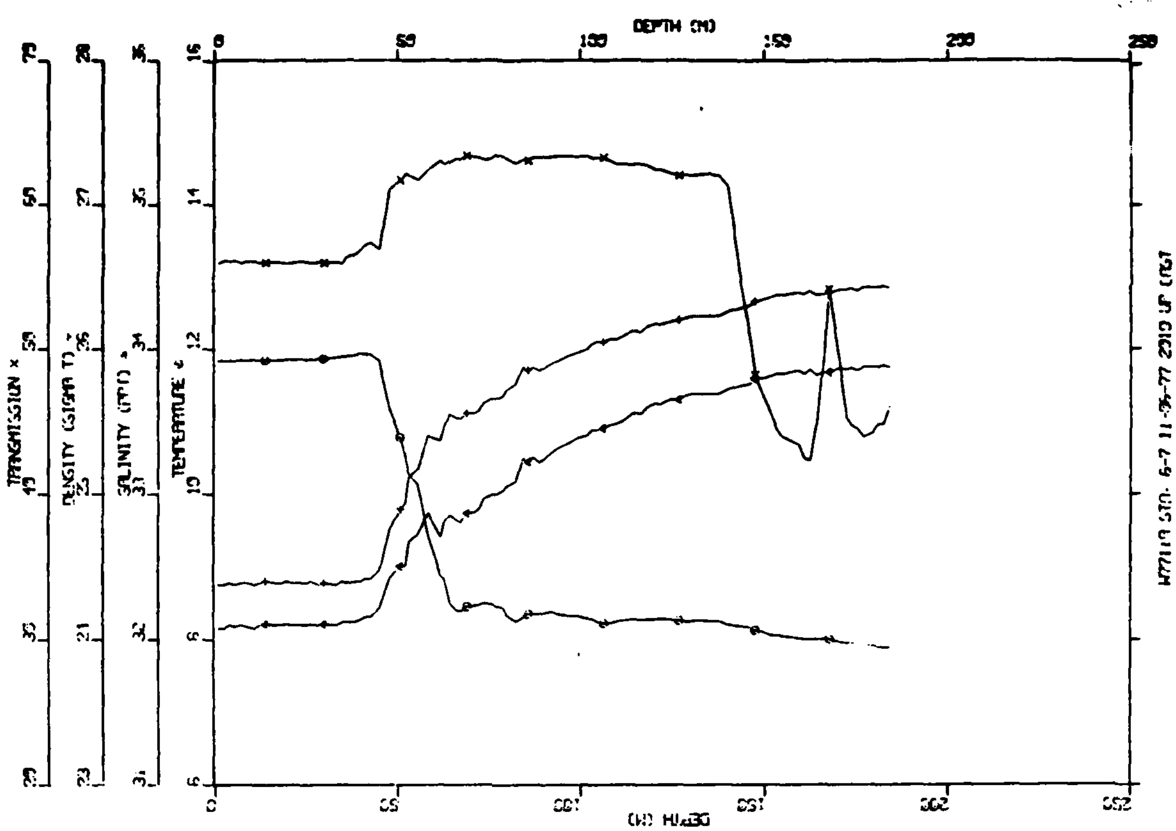
W7711A STA 6-6 11-06-77 1830 DN CAST PARTIAL

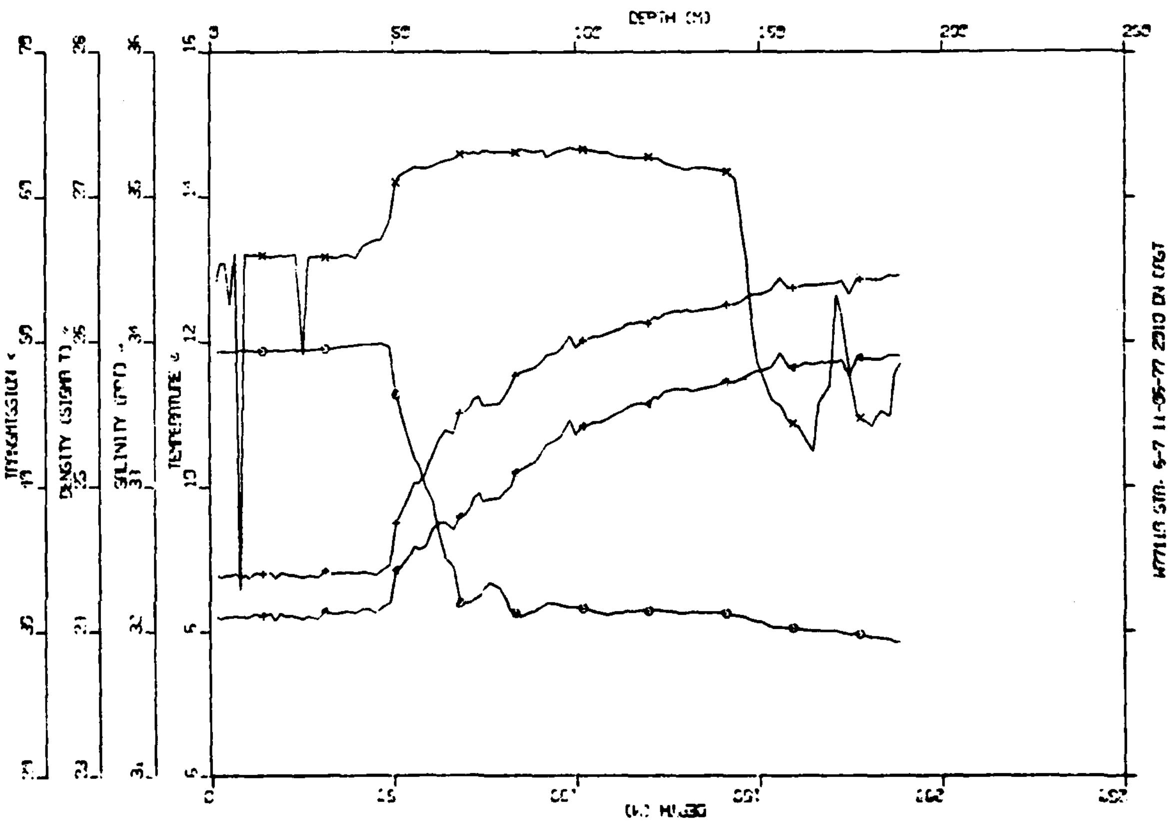


W7711A STA 6-6 11-06-77 1830 UP CAST PARTIAL

W7711A STA 6-7 11-06-77 2010 DN CAST

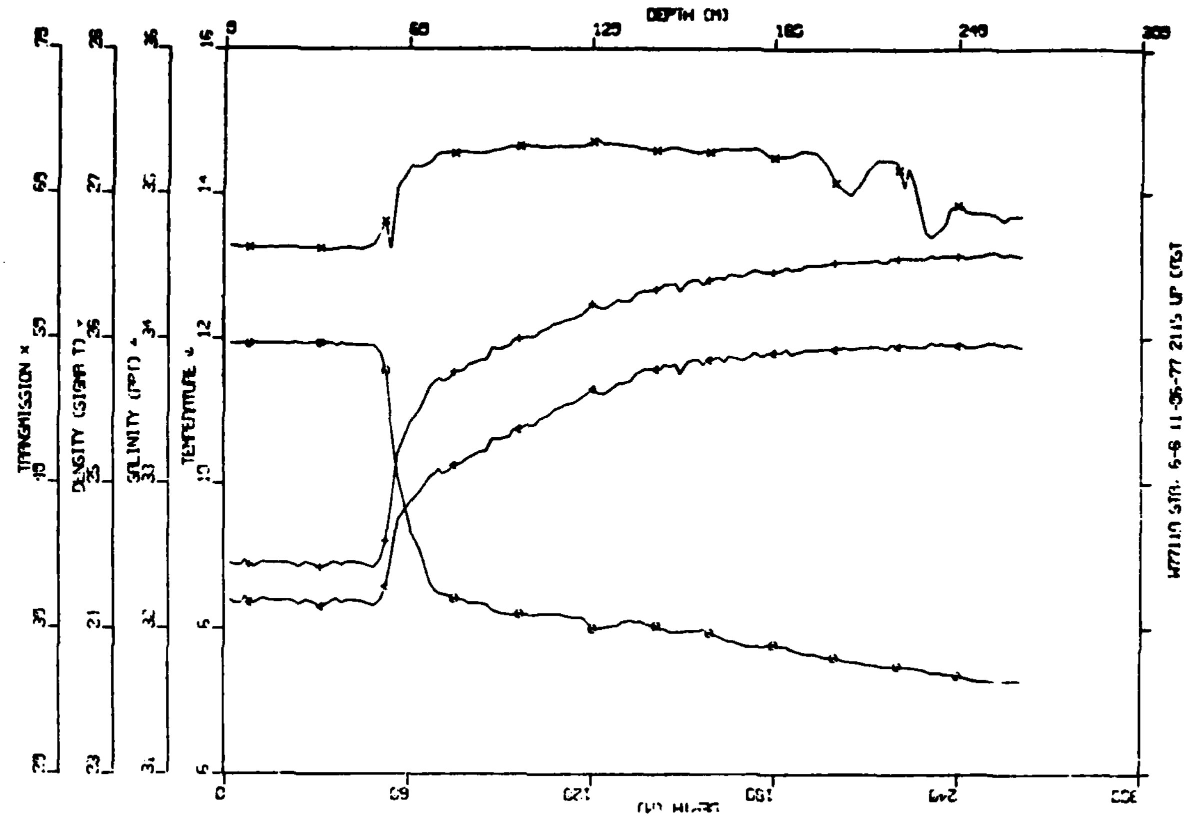
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.87	32.10	24.39	54.25
10.0	11.89	32.11	24.39	53.94
15.0	11.88	32.12	24.41	55.93
20.0	11.88	32.12	24.40	55.93
25.0	11.89	32.10	24.39	52.57
30.0	11.90	32.12	24.40	55.85
35.0	11.93	32.13	24.40	55.87
40.0	11.96	32.14	24.41	56.14
45.0	11.97	32.14	24.40	56.97
50.0	11.55	32.33	24.62	59.71
60.0	9.84	32.67	25.19	62.12
70.0	8.40	32.84	25.54	63.03
80.0	8.49	32.96	25.63	63.16
90.0	8.33	33.23	25.86	63.11
100.0	8.33	33.40	25.99	63.28
110.0	8.25	33.49	26.07	62.96
120.0	8.29	33.59	26.14	62.73
130.0	8.26	33.67	26.22	61.99
140.0	8.25	33.71	26.24	61.72
150.0	8.12	33.81	26.34	48.22
160.0	8.04	33.83	26.37	44.20
170.0	8.00	33.86	26.40	49.25
180.0	7.93	33.88	26.43	44.46
188.5	7.85	33.90	26.46	48.25

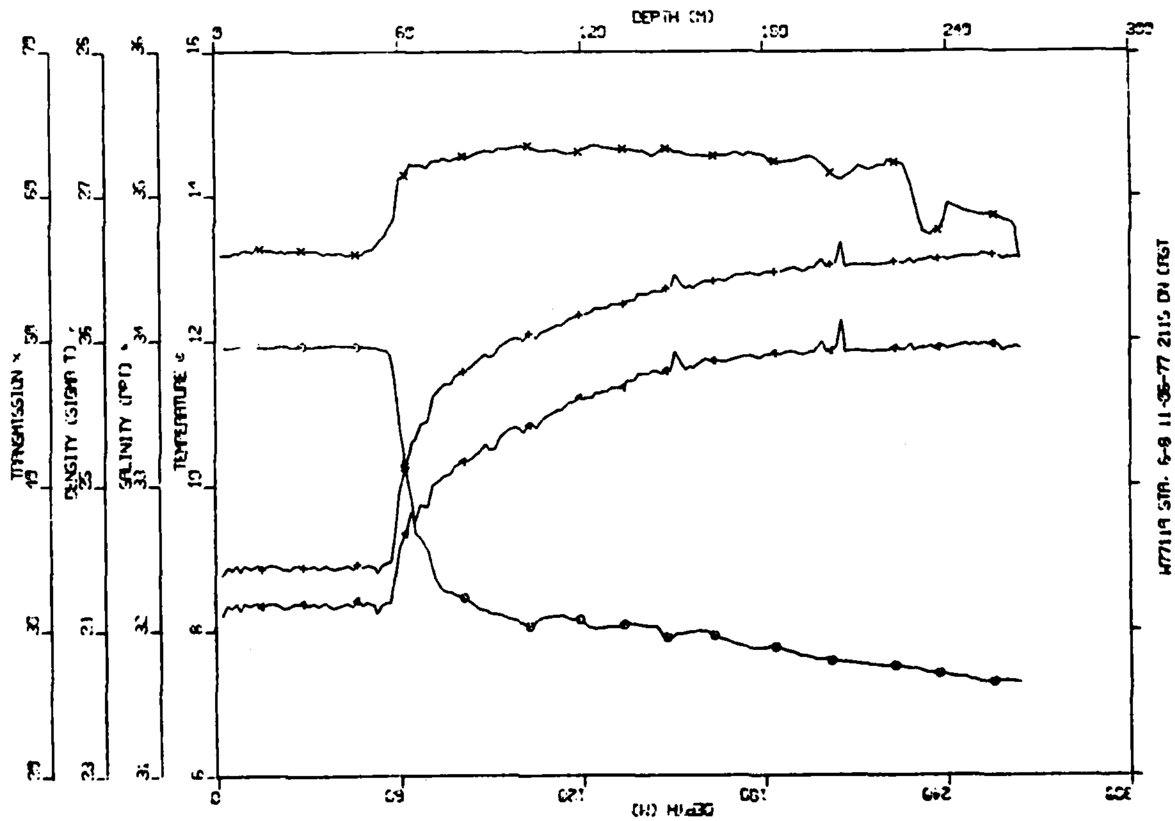

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
W7719 STA. 6-7 11-06-77 2310 UP CAST


DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
W7719 STA. 6-7 11-06-77 2310 DN CAST

W7711A STA 6-8 11-06-77 2115 DN CAST

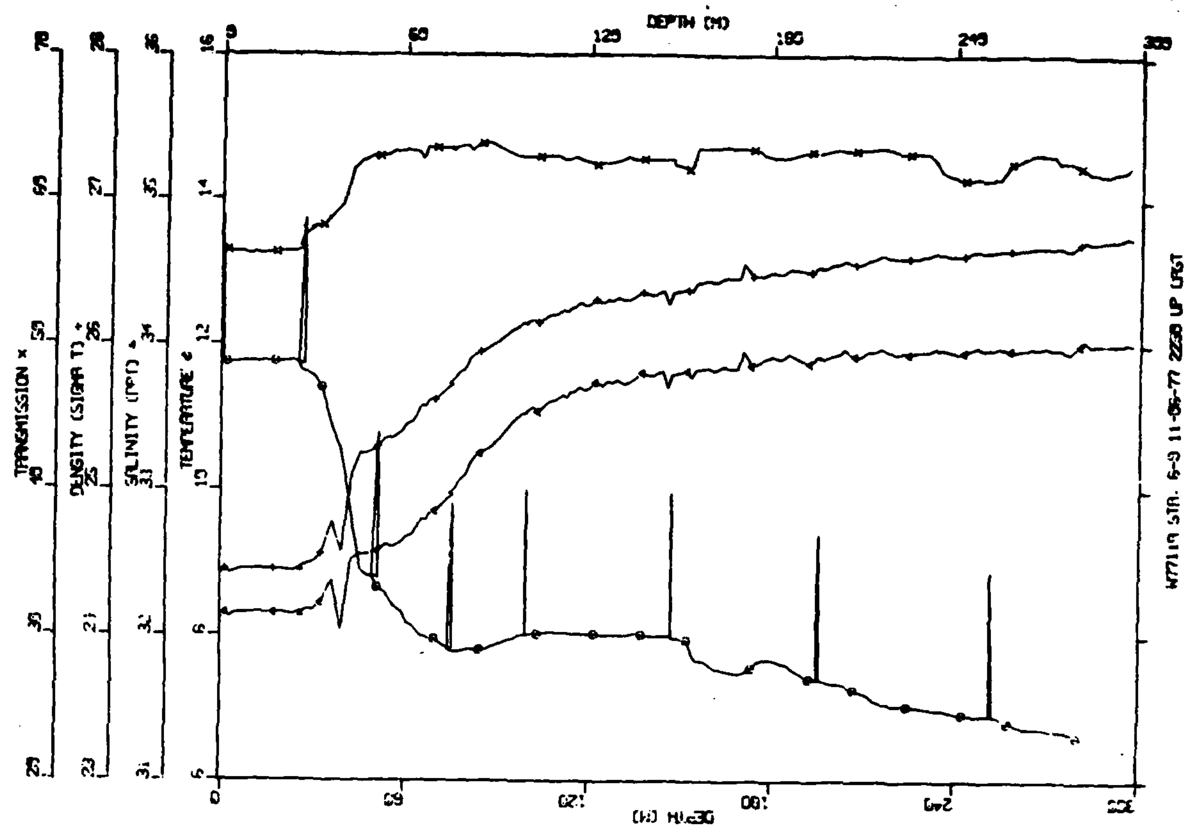
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.91	32.17	24.43	55.77
10.0	11.92	32.18	24.44	56.19
15.0	11.92	32.18	24.44	56.31
20.0	11.93	32.18	24.44	56.15
25.0	11.92	32.19	24.45	56.21
30.0	11.92	32.19	24.44	56.24
35.0	11.93	32.19	24.44	56.09
40.0	11.93	32.18	24.44	56.04
45.0	11.93	32.19	24.44	55.95
50.0	11.92	32.18	24.44	56.26
60.0	10.83	32.55	24.92	60.61
70.0	8.96	32.94	25.54	62.27
80.0	8.48	33.16	25.78	62.66
90.0	8.25	33.27	25.91	63.14
100.0	8.12	33.40	26.02	63.44
110.0	8.20	33.50	26.09	63.22
120.0	8.11	33.61	26.18	63.26
130.0	8.06	33.67	26.25	63.35
140.0	8.07	33.77	26.32	63.09
150.0	7.93	33.85	26.40	63.17
160.0	7.98	33.86	26.40	62.81
170.0	7.82	33.88	26.44	62.91
180.0	7.76	33.90	26.47	62.77
190.0	7.69	33.92	26.50	62.46
200.0	7.60	33.95	26.53	62.05
210.0	7.55	33.93	26.52	61.80
220.0	7.51	33.93	26.53	62.24
230.0	7.47	33.95	26.55	59.07
240.0	7.38	33.95	26.56	58.95
250.0	7.30	33.97	26.59	58.74
260.0	7.30	33.95	26.57	58.25
263.8	7.29	33.95	26.57	56.17

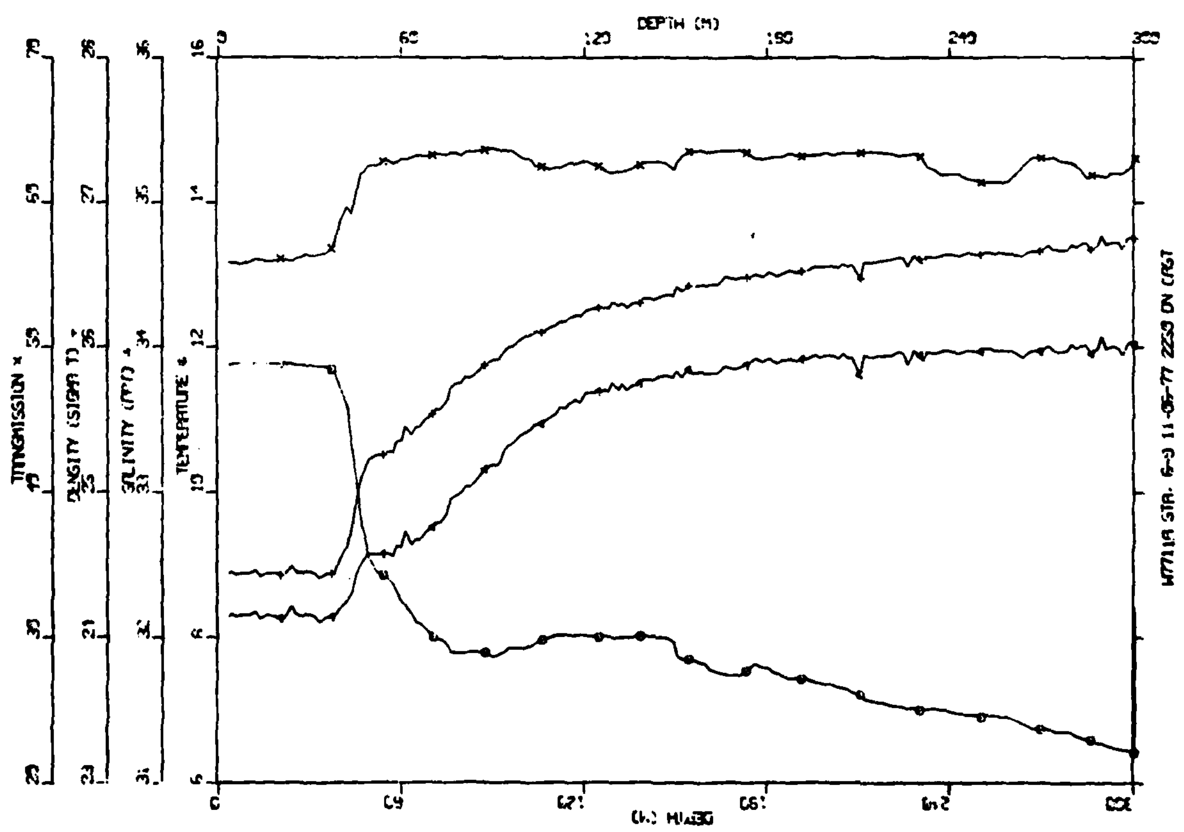

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) +
TEMPERATURE
W7711A STA. 6-8 11-05-77 2115 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) +
TEMPERATURE
W7711A STA. 6-8 11-05-77 2115 DN CAST

W7711A STA 6-9 11-06-77 2250 DN CAST

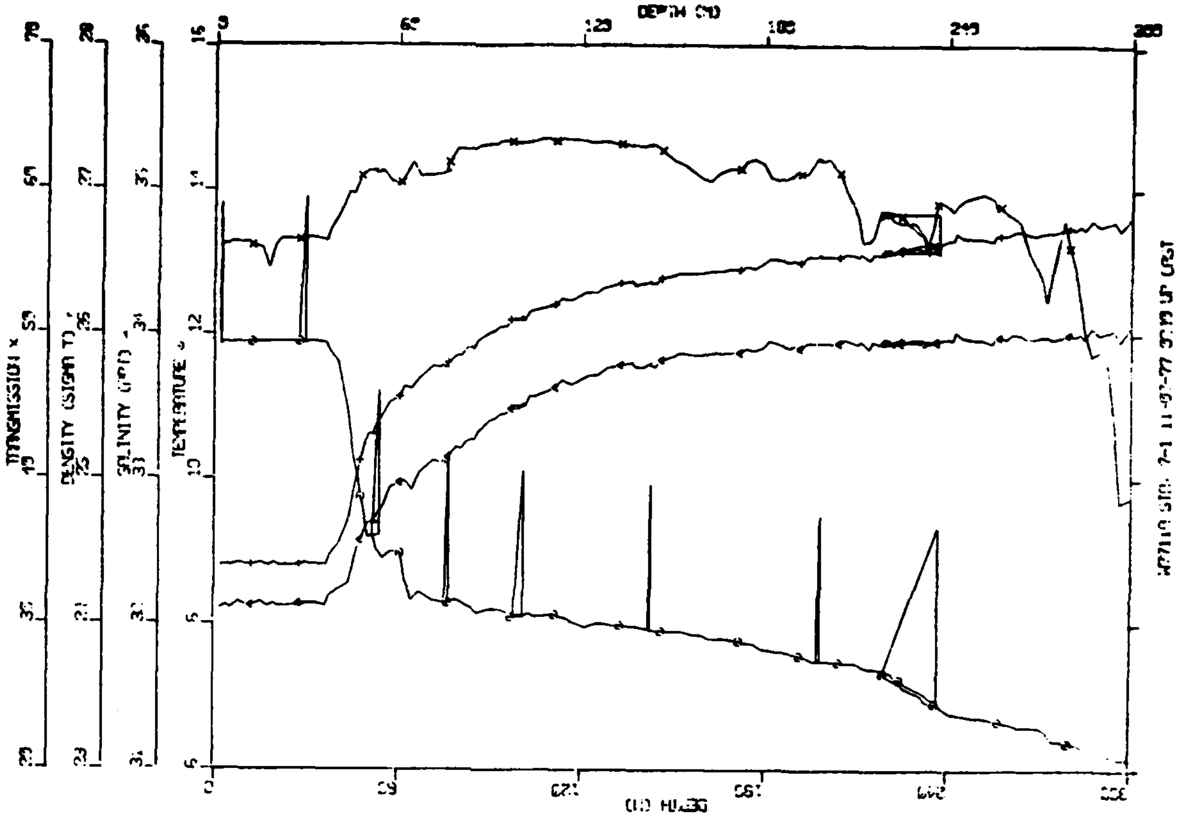
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.78	32.15	24.44	55.18
10.0	11.78	32.16	24.45	55.91
15.0	11.78	32.15	24.44	53.02
20.0	11.78	32.13	24.43	55.25
25.0	11.77	32.18	24.47	56.09
30.0	11.75	32.15	24.45	56.33
35.0	11.73	32.13	24.43	56.51
40.0	11.46	32.20	24.53	58.53
45.0	10.30	32.39	24.89	60.37
50.0	9.10	32.57	25.23	62.48
60.0	8.51	32.65	25.38	62.95
70.0	8.04	32.75	25.53	63.27
80.0	7.79	33.01	25.77	63.37
90.0	7.76	33.19	25.91	63.64
100.0	7.87	33.40	26.07	63.12
110.0	8.01	33.54	26.15	62.41
120.0	8.03	33.67	26.24	62.83
130.0	8.00	33.73	26.30	62.11
140.0	8.02	33.77	26.33	62.74
150.0	7.85	33.82	26.39	62.61
160.0	7.63	33.83	26.43	63.52
170.0	7.49	33.86	26.48	63.56
180.0	7.58	33.92	26.51	63.09
190.0	7.44	33.92	26.53	63.30
200.0	7.36	33.94	26.55	63.32
210.0	7.21	33.88	26.53	63.38
220.0	7.09	33.96	26.61	63.41
230.0	7.02	33.95	26.61	63.17
240.0	6.99	33.98	26.64	61.93
250.0	6.92	33.98	26.64	61.47
260.0	6.89	33.97	26.64	61.72
270.0	6.74	33.98	26.67	63.07
280.0	6.69	34.00	26.70	62.70
290.0	6.55	34.04	26.74	61.81
300.0	6.74	34.03	26.75	62.76
300.6	6.92	34.01	26.74	63.11

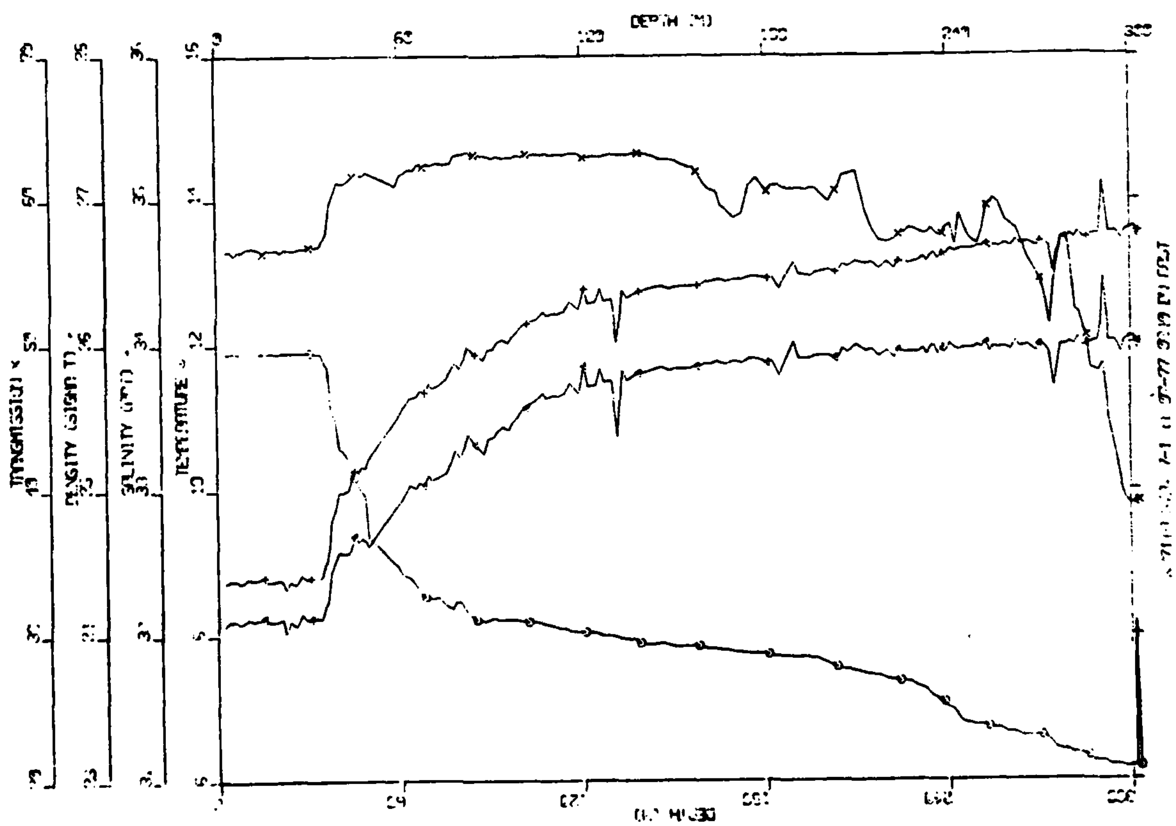

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE

W7711A STA 7-1 11-07-77 0240 DN CAST

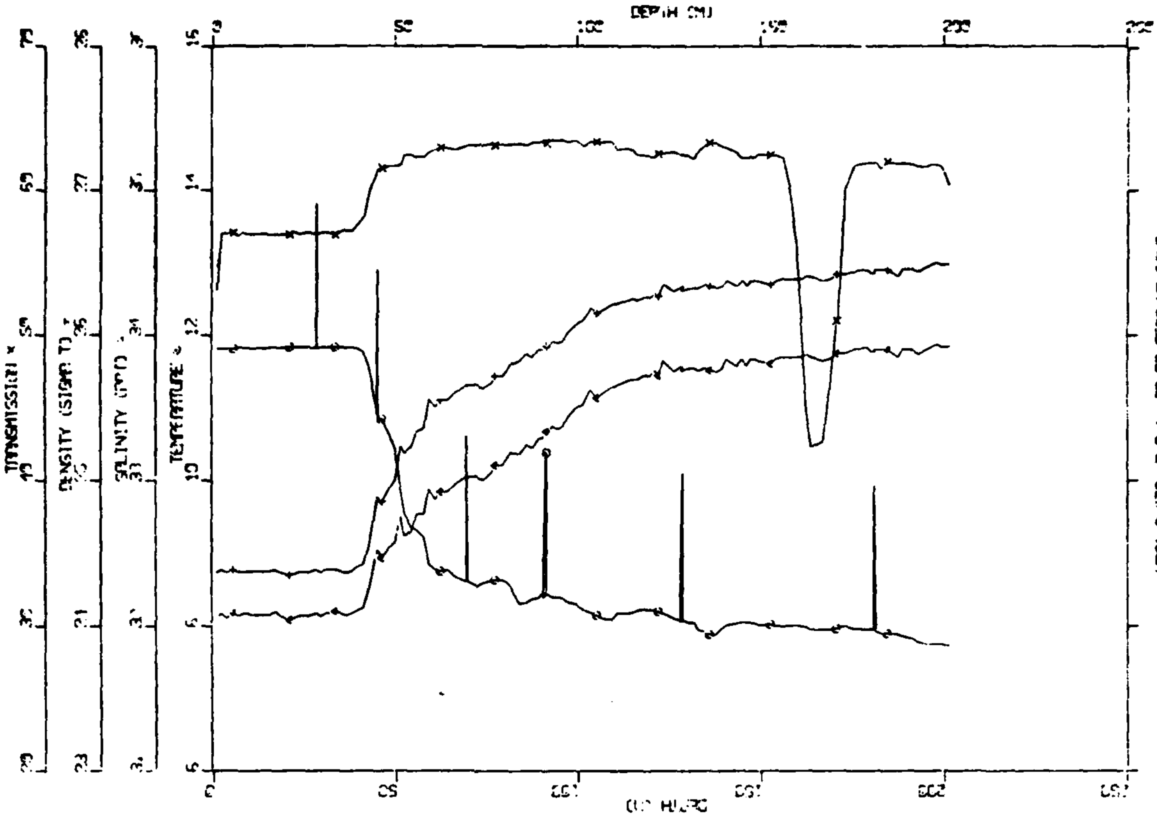
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.90	32.11	24.39	56.28
10.0	11.90	32.11	24.39	56.70
15.0	11.90	32.12	24.40	56.57
20.0	11.90	32.11	24.39	56.60
25.0	11.90	32.10	24.38	56.63
30.0	11.90	32.12	24.40	56.77
35.0	11.75	32.21	24.50	57.53
40.0	10.65	32.56	24.97	61.12
45.0	10.20	32.65	25.12	61.58
50.0	9.39	32.71	25.29	61.68
60.0	8.89	32.95	25.56	61.68
70.0	8.53	33.09	25.72	62.50
80.0	8.43	33.27	25.88	63.21
90.0	8.24	33.36	25.98	63.04
100.0	8.20	33.54	26.13	63.14
110.0	8.13	33.65	26.22	63.18
120.0	8.06	33.77	26.32	63.11
130.0	8.00	33.65	26.24	63.16
140.0	7.90	33.82	26.38	63.22
150.0	7.86	33.84	26.40	62.79
160.0	7.85	33.87	26.43	61.39
170.0	7.78	33.88	26.45	59.01
180.0	7.74	33.89	26.47	61.01
190.0	7.71	33.70	26.33	60.80
200.0	7.63	33.93	26.51	60.39
210.0	7.51	33.98	26.57	61.26
220.0	7.41	33.94	26.55	57.21
230.0	7.30	33.96	26.58	57.86
240.0	7.01	33.97	26.63	57.95
250.0	6.76	33.98	26.67	57.19
260.0	6.67	33.98	26.69	58.50
270.0	6.60	33.98	26.69	54.56
280.0	6.39	34.00	26.74	55.89
290.0	6.26	34.16	26.87	48.15
300.0	6.18	34.04	26.79	39.16
302.9	6.17	33.98	26.75	38.85

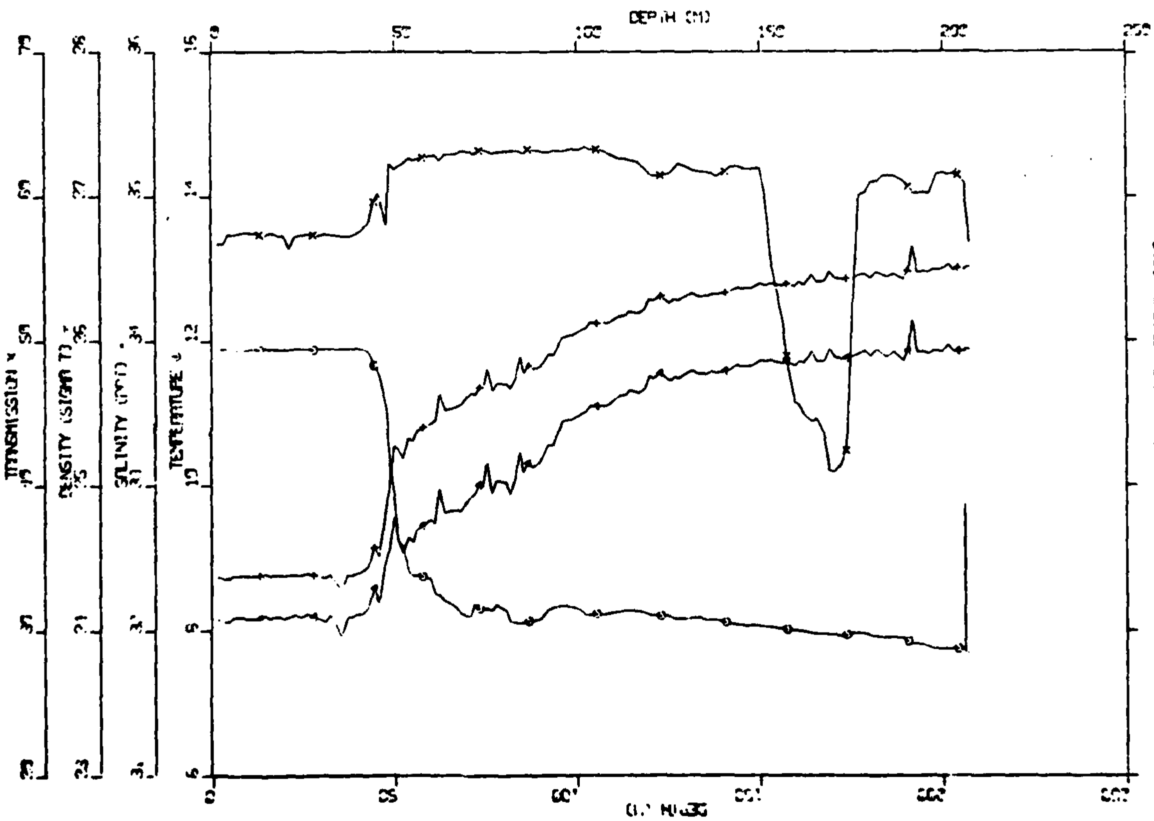




W7711A STA 7-2 11-07-77 0520 DN CAST

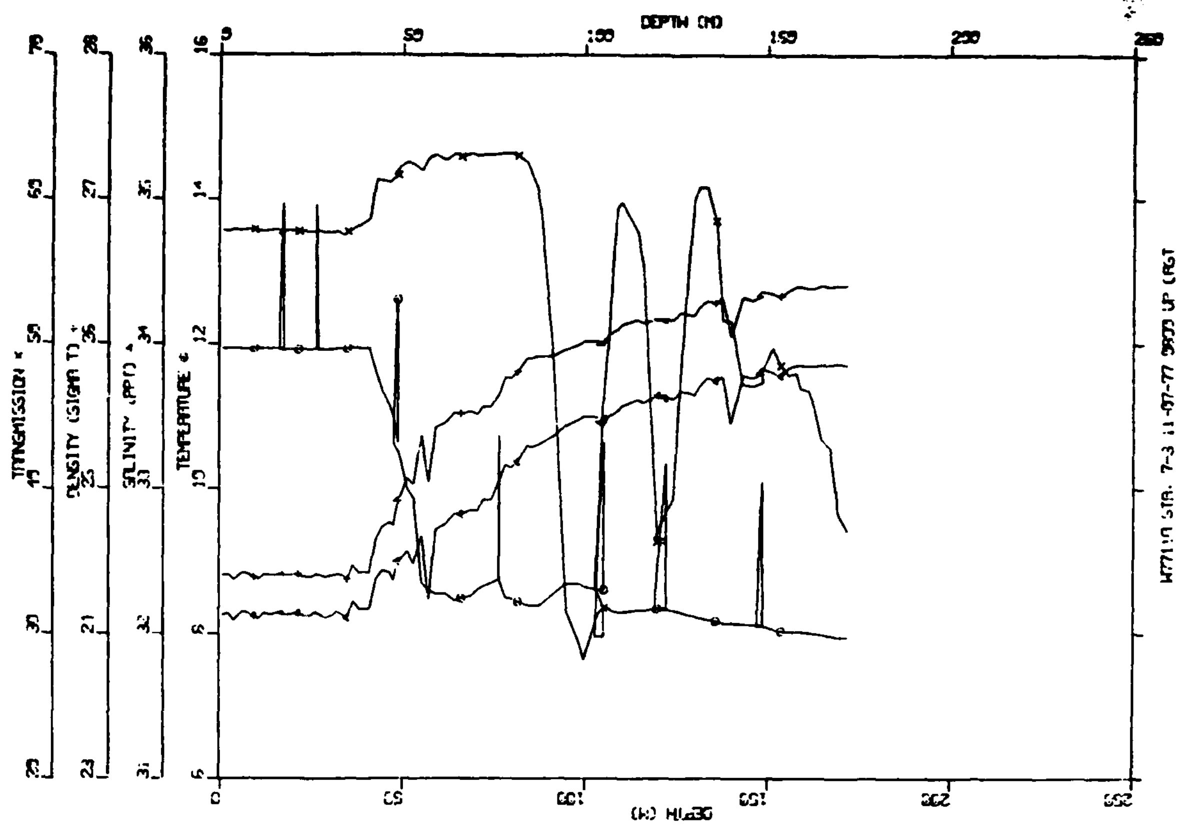
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.89	32.08	24.37	57.25
10.0	11.89	32.08	24.37	57.51
15.0	11.89	32.09	24.38	57.34
20.0	11.88	32.09	24.38	57.02
25.0	11.89	32.10	24.39	57.35
30.0	11.89	32.08	24.37	57.34
35.0	11.89	32.04	24.33	57.30
40.0	11.89	32.11	24.40	57.51
45.0	11.60	32.25	24.56	59.46
50.0	9.79	32.69	25.20	62.06
60.0	8.65	32.76	25.44	62.83
70.0	8.25	32.88	25.61	63.06
80.0	8.27	33.00	25.69	63.13
90.0	8.19	33.19	25.84	63.18
100.0	8.30	33.48	26.06	63.30
110.0	8.26	33.59	26.15	62.91
120.0	8.23	33.74	26.27	61.63
130.0	8.17	33.77	26.31	62.07
140.0	8.13	33.79	26.33	61.67
150.0	8.07	33.85	26.38	61.40
160.0	8.00	33.84	26.38	46.21
170.0	7.94	33.90	26.45	41.28
180.0	7.95	33.91	26.45	60.70
190.0	7.87	33.93	26.48	60.84
200.0	7.76	33.94	26.50	61.58
207.3	7.69	33.94	26.51	57.63

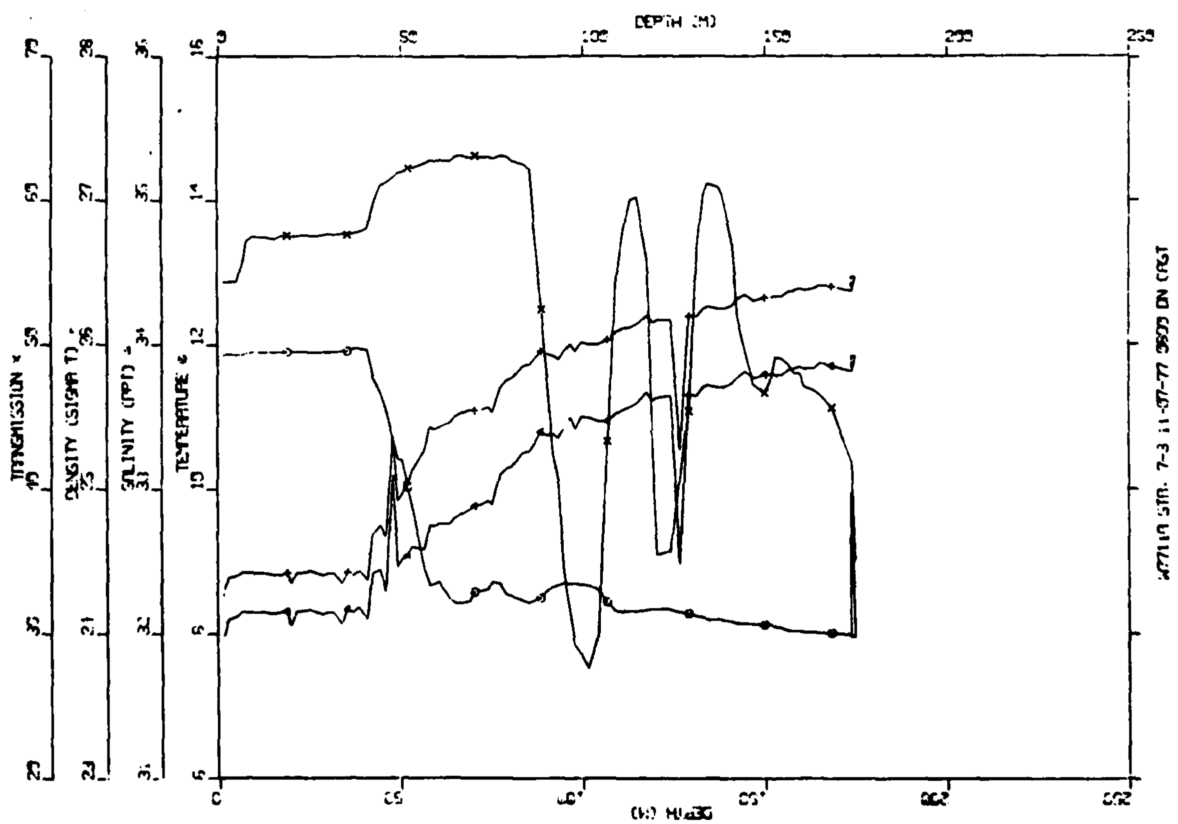

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C

W7711A STA 7-3 11-07-77 0800 DN CAST

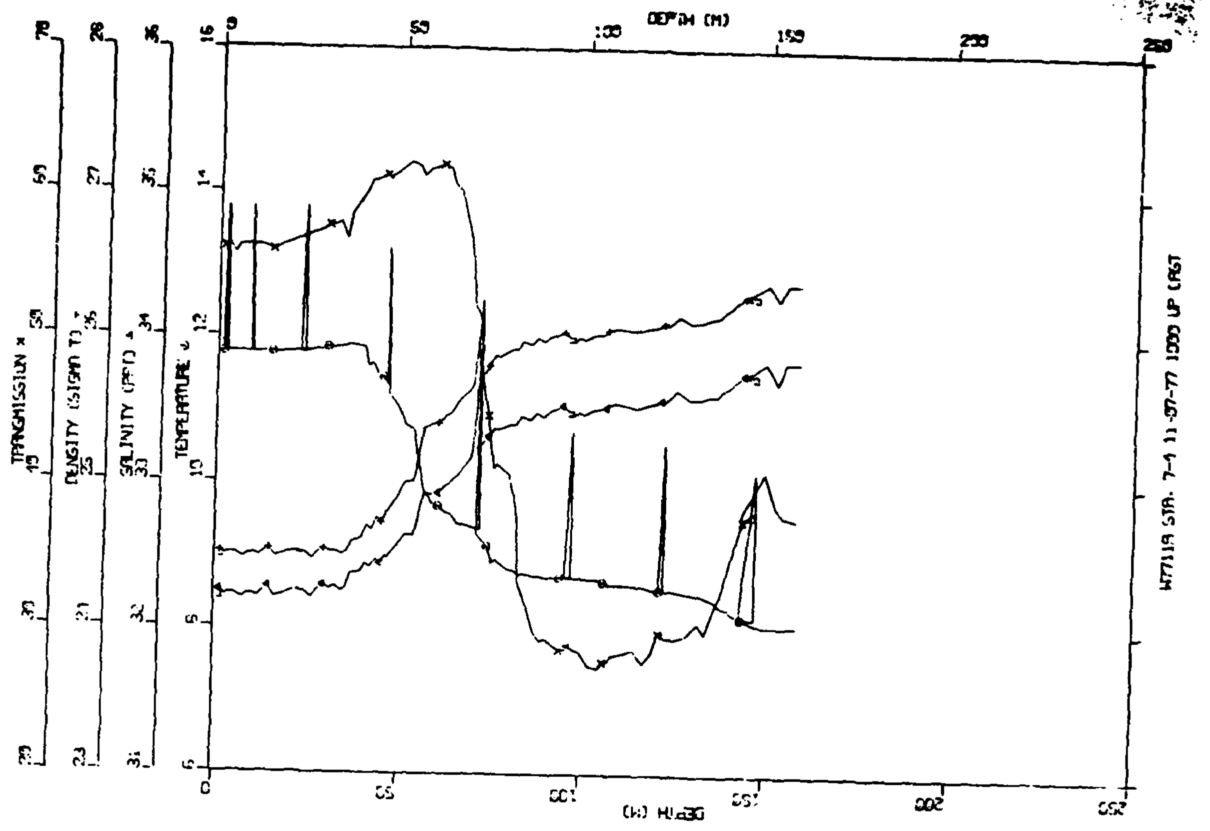
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.87	32.13	24.41	51.55
10.0	11.91	32.15	24.42	57.47
15.0	11.91	32.15	24.41	57.45
20.0	11.91	32.11	24.39	57.55
25.0	11.91	32.16	24.43	57.59
30.0	11.91	32.15	24.42	57.68
35.0	11.93	32.14	24.41	57.69
40.0	11.89	32.19	24.45	58.26
45.0	11.24	32.47	24.78	61.01
50.0	10.39	32.55	25.00	62.04
60.0	8.69	32.77	25.44	62.81
70.0	8.54	32.88	25.56	63.10
80.0	8.54	33.17	25.78	62.88
90.0	8.58	33.39	25.94	48.58
100.0	8.69	33.49	26.00	28.57
110.0	8.35	33.54	26.10	54.82
120.0	8.36	33.64	26.18	39.74
130.0	8.28	33.49	26.07	50.20
140.0	8.19	33.73	26.27	57.82
150.0	8.13	33.79	26.33	47.08
160.0	8.04	33.85	26.39	47.68
170.0	8.01	33.86	26.40	43.89
173.6	8.45	33.87	26.42	36.20

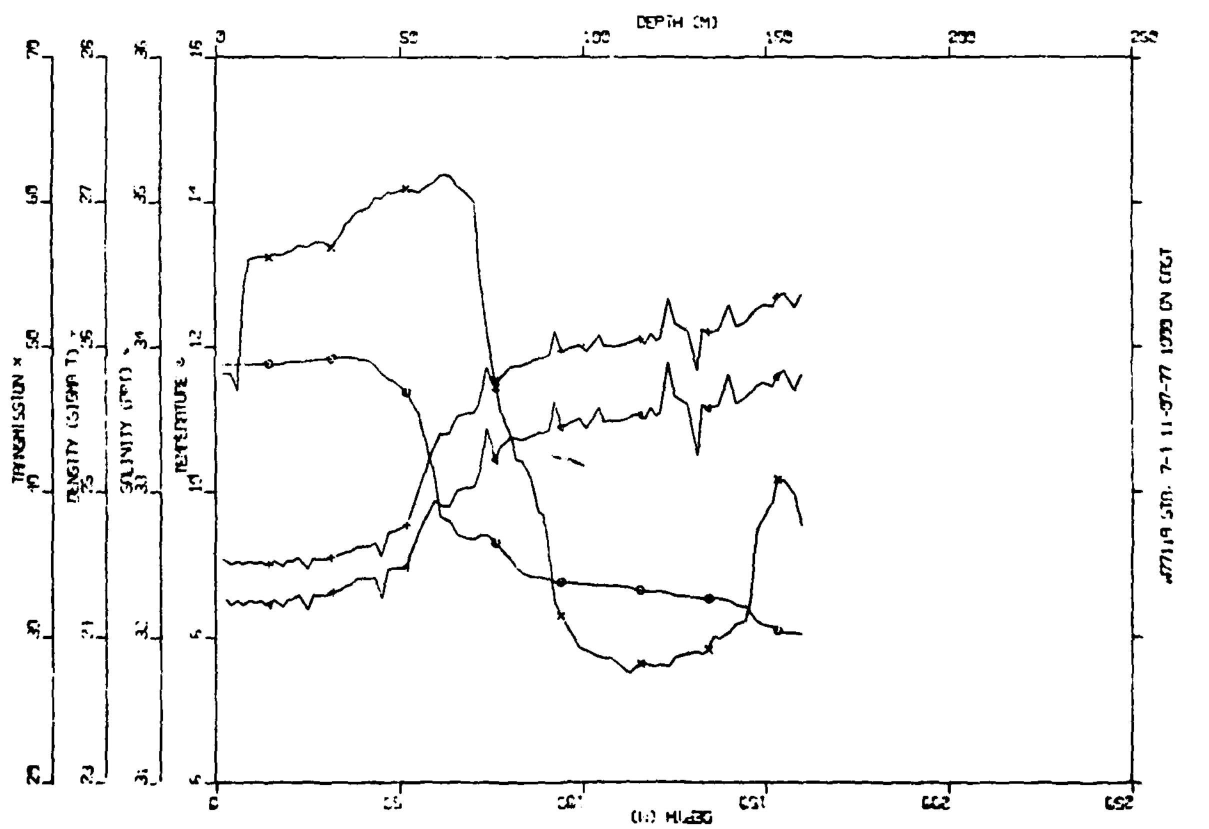

DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 7-4 11-07-77 1000 DN CAST

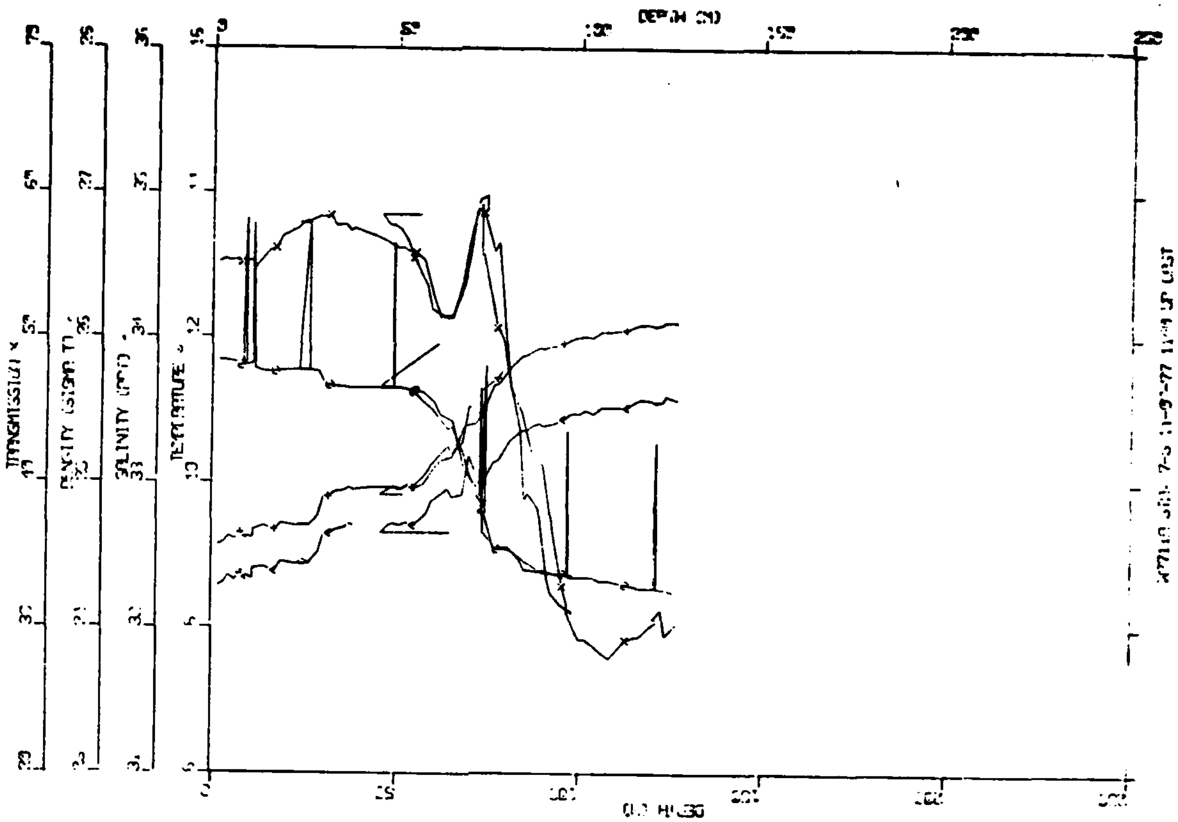
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.77	32.24	24.51	47.85
10.0	11.78	32.25	24.52	56.01
15.0	11.78	32.24	24.51	56.31
20.0	11.80	32.26	24.53	56.66
25.0	11.82	32.24	24.51	57.01
30.0	11.85	32.30	24.54	57.20
35.0	11.87	32.35	24.59	58.25
40.0	11.83	32.41	24.63	59.51
45.0	11.65	32.37	24.64	60.40
50.0	11.42	32.51	24.79	60.78
60.0	10.10	32.90	25.32	61.56
70.0	9.38	33.06	25.56	59.03
80.0	9.09	33.36	25.85	43.90
90.0	8.80	33.45	25.96	36.42
100.0	8.73	33.49	26.01	29.25
110.0	8.70	33.50	26.01	28.05
120.0	8.62	33.54	26.06	28.02
130.0	8.55	33.48	26.02	28.88
140.0	8.49	33.71	26.21	30.41
150.0	8.17	33.74	26.29	38.60
160.0	8.05	33.78	26.34	38.24

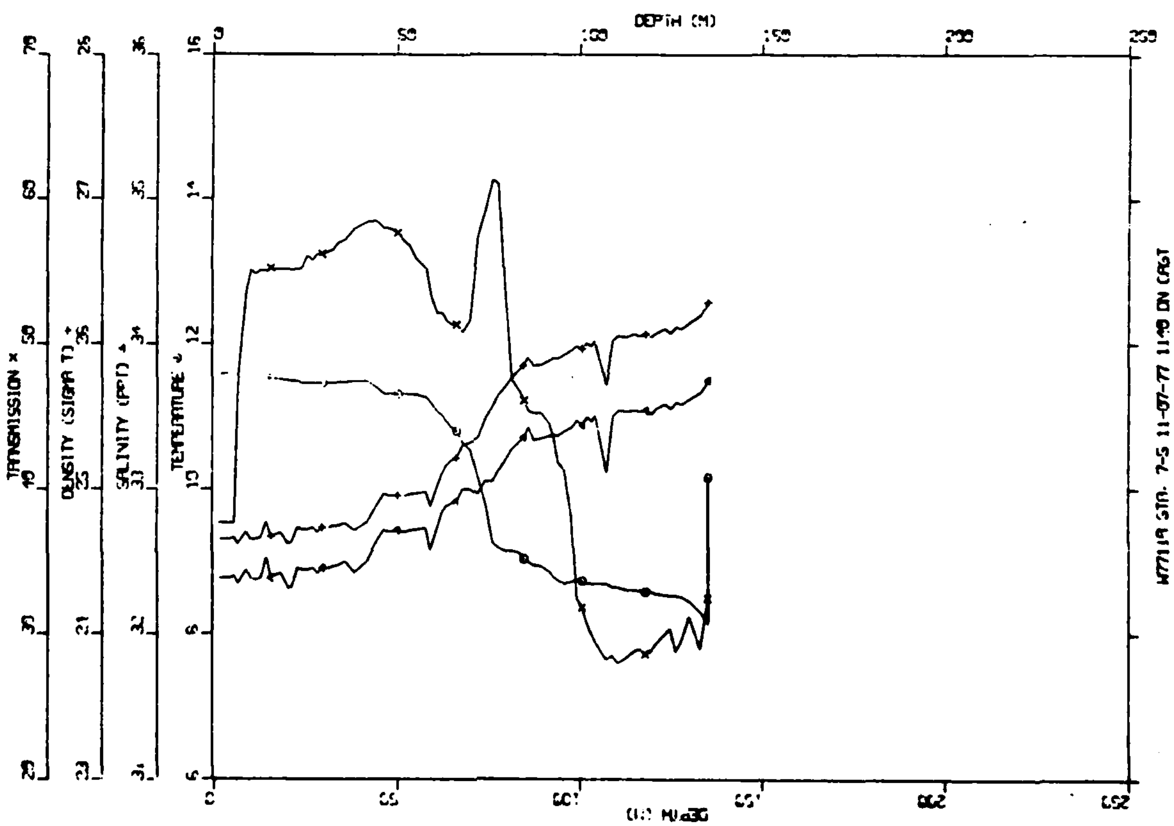

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W77119 STA. 7-1 11-07-77 1939 UP CAST


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W77119 STA. 7-1 11-07-77 1939 DN CAST

W7711A STA 7-5 11-05-77 1140 DN CAST

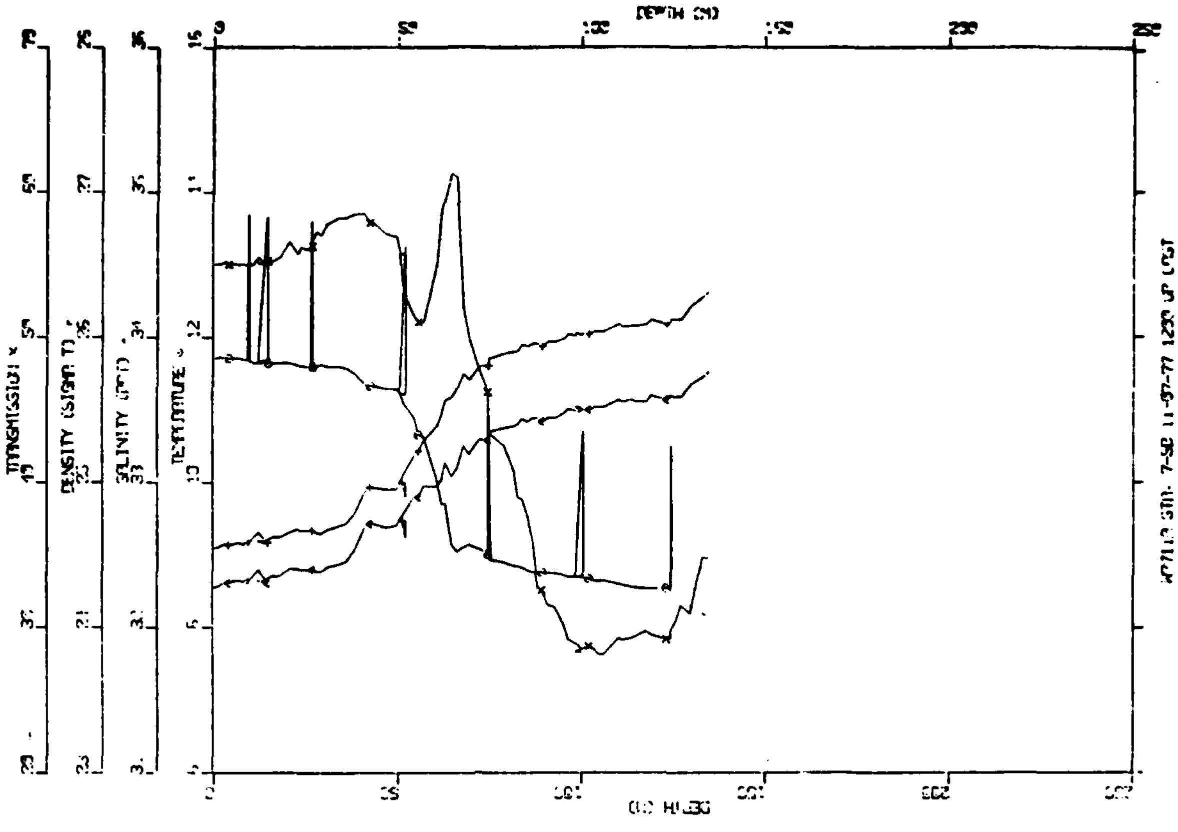
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.59	32.17	24.49	25.86
10.0	11.57	32.40	24.67	54.23
15.0	11.54	32.44	24.72	55.13
20.0	11.51	32.36	24.66	55.16
25.0	11.48	32.45	24.73	55.64
30.0	11.47	32.45	24.73	56.28
35.0	11.48	32.48	24.75	57.18
40.0	11.48	32.50	24.77	58.13
45.0	11.38	32.65	24.90	58.32
50.0	11.33	32.72	24.96	57.67
60.0	11.15	32.69	24.98	53.08
70.0	10.46	33.00	25.33	53.16
80.0	9.16	33.22	25.73	52.58
90.0	8.91	33.36	25.88	44.90
100.0	8.73	33.47	25.99	32.60
110.0	8.66	33.49	26.01	28.29
120.0	8.58	33.55	26.07	29.11
130.0	8.46	33.63	26.15	30.24
135.0	8.66	33.76	26.30	31.42

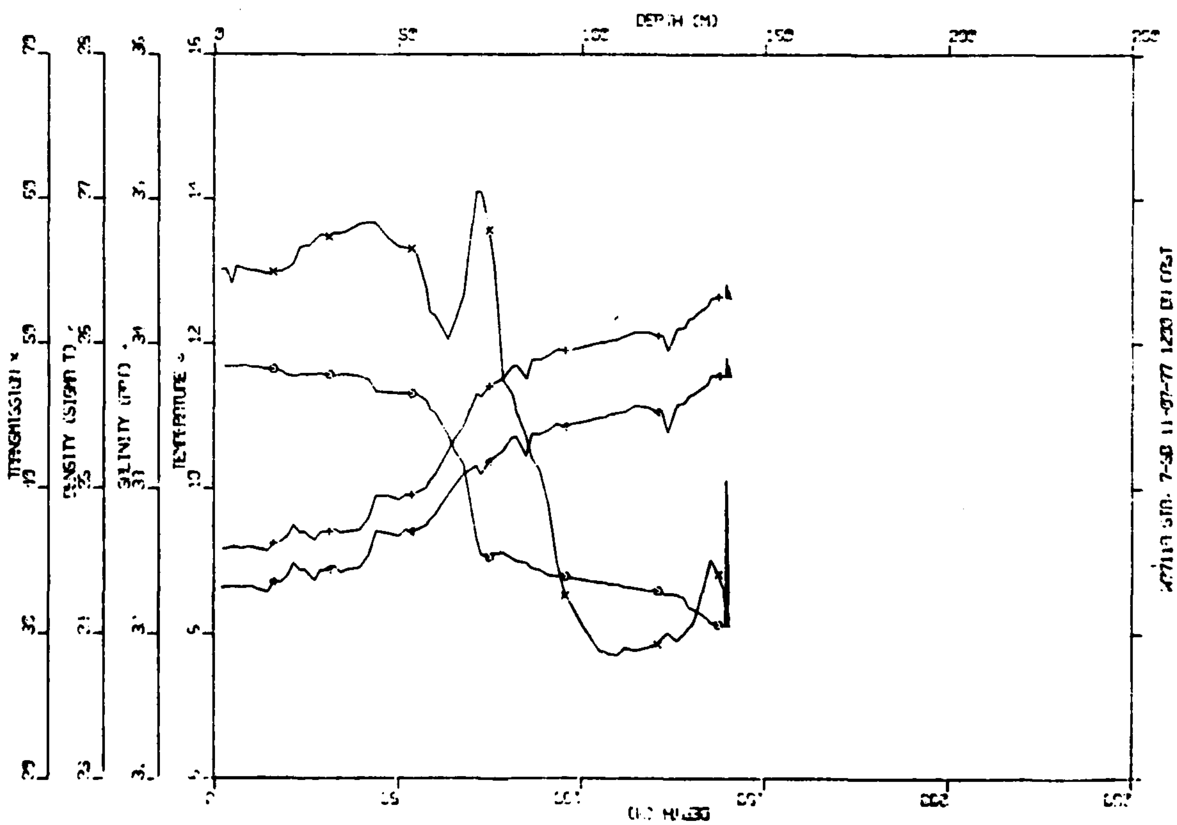

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ◊
TEMPERATURE ◊


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ◊
TEMPERATURE ◊
W7710 STA. 7-5 11-07-77 1140 DN CAST

W7711A STA 7-5B 11-07-77 1200 DN CAST

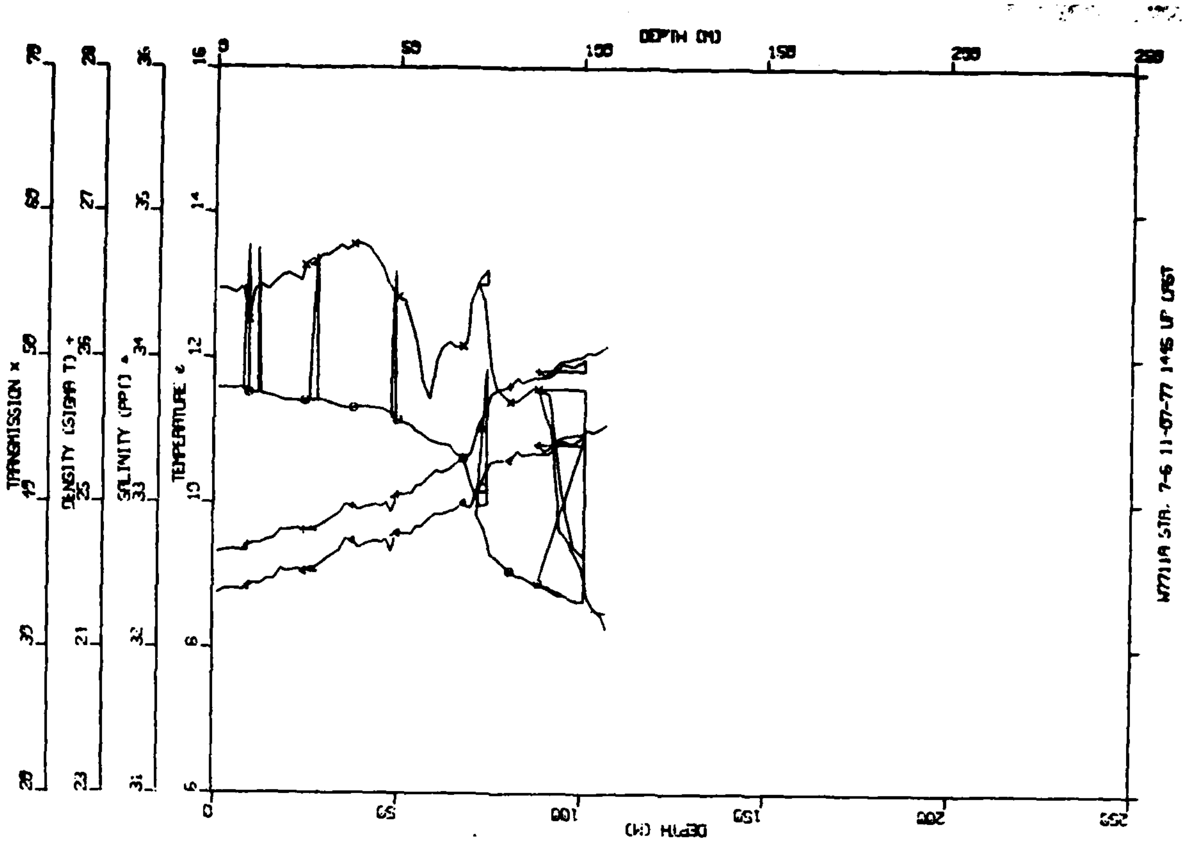
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.69	32.33	24.60	54.79
10.0	11.69	32.33	24.60	55.09
15.0	11.66	32.33	24.61	54.95
20.0	11.58	32.43	24.70	55.39
25.0	11.58	32.42	24.69	56.82
30.0	11.58	32.45	24.72	57.51
35.0	11.58	32.45	24.71	57.81
40.0	11.53	32.51	24.77	58.26
45.0	11.36	32.68	24.93	57.84
50.0	11.32	32.70	24.94	56.84
60.0	10.98	32.85	25.13	51.60
70.0	9.73	33.12	25.55	57.40
80.0	9.07	33.31	25.80	47.44
90.0	8.84	33.40	25.91	39.36
100.0	8.75	33.47	25.98	30.67
110.0	8.67	33.52	26.03	28.69
120.0	8.59	33.55	26.06	29.26
130.0	8.37	33.64	26.18	30.65
140.0	8.54	33.78	26.32	31.84
140.5	8.12	33.80	26.34	31.09

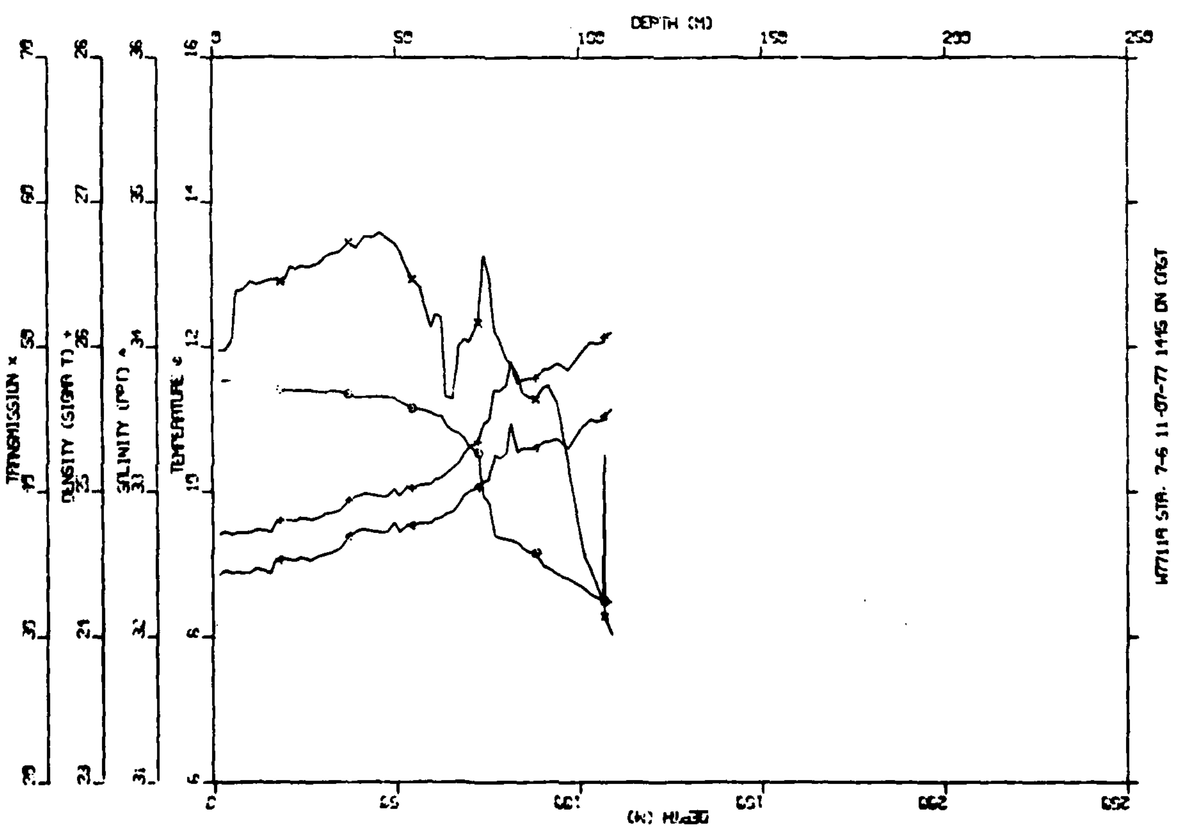

DEPTH (M)
TEMPERATURE C
SALINITY (PPT)
DENSITY (SIGMA T)
TRANSMISSION %


DEPTH (M)
TEMPERATURE C
SALINITY (PPT)
DENSITY (SIGMA T)
TRANSMISSION %

W77[illegible]1A STA 7-6 11-07-77 1445 DN CAST

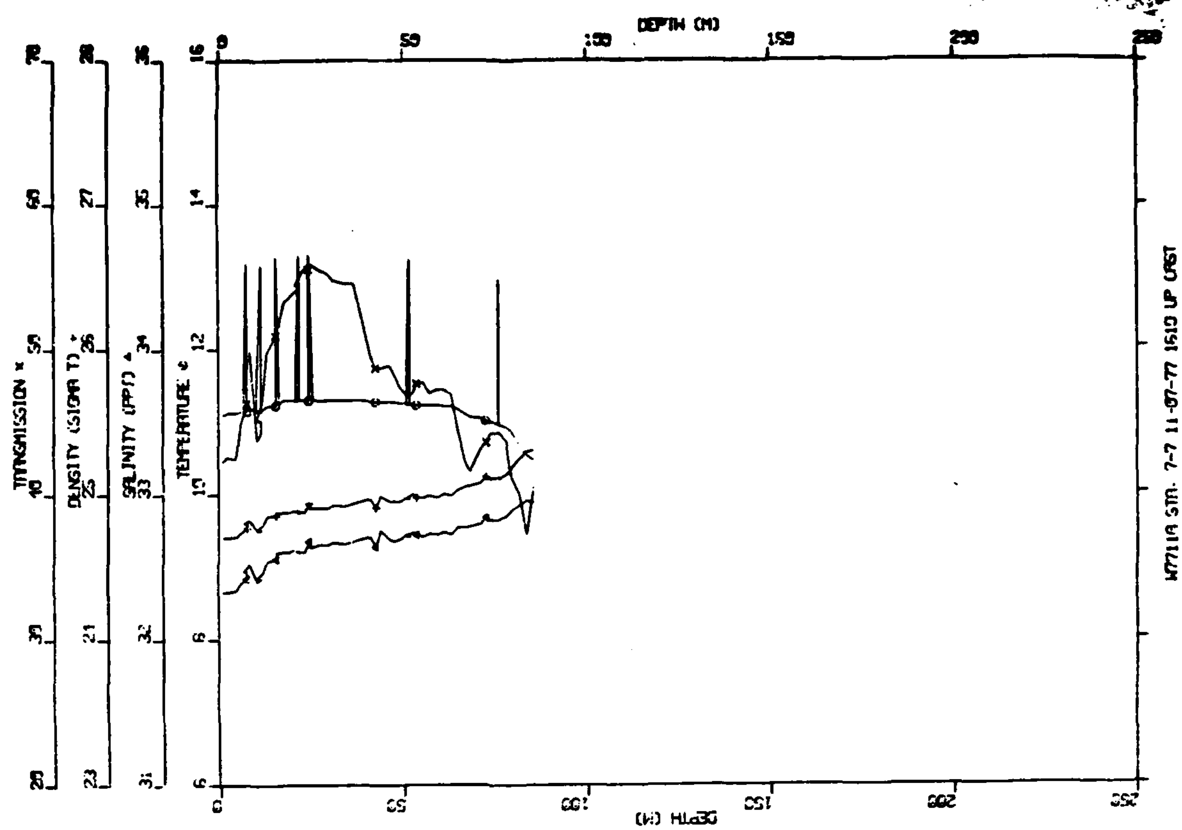
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.54	32.45	24.72	51.06
10.0	11.51	32.45	24.73	54.30
15.0	11.48	32.47	24.75	54.56
20.0	11.41	32.54	24.81	54.92
25.0	11.40	32.54	24.82	55.56
30.0	11.39	32.57	24.84	56.04
35.0	11.39	32.63	24.89	56.75
40.0	11.32	32.74	24.98	57.24
45.0	11.32	32.73	24.97	57.74
50.0	11.29	32.76	25.00	57.00
60.0	11.10	32.81	25.08	52.22
70.0	10.64	33.01	25.31	50.78
80.0	9.36	33.32	25.77	49.51
90.0	9.04	33.34	25.84	47.08
100.0	8.72	33.42	25.94	38.21
108.8	8.49	33.57	26.10	30.54

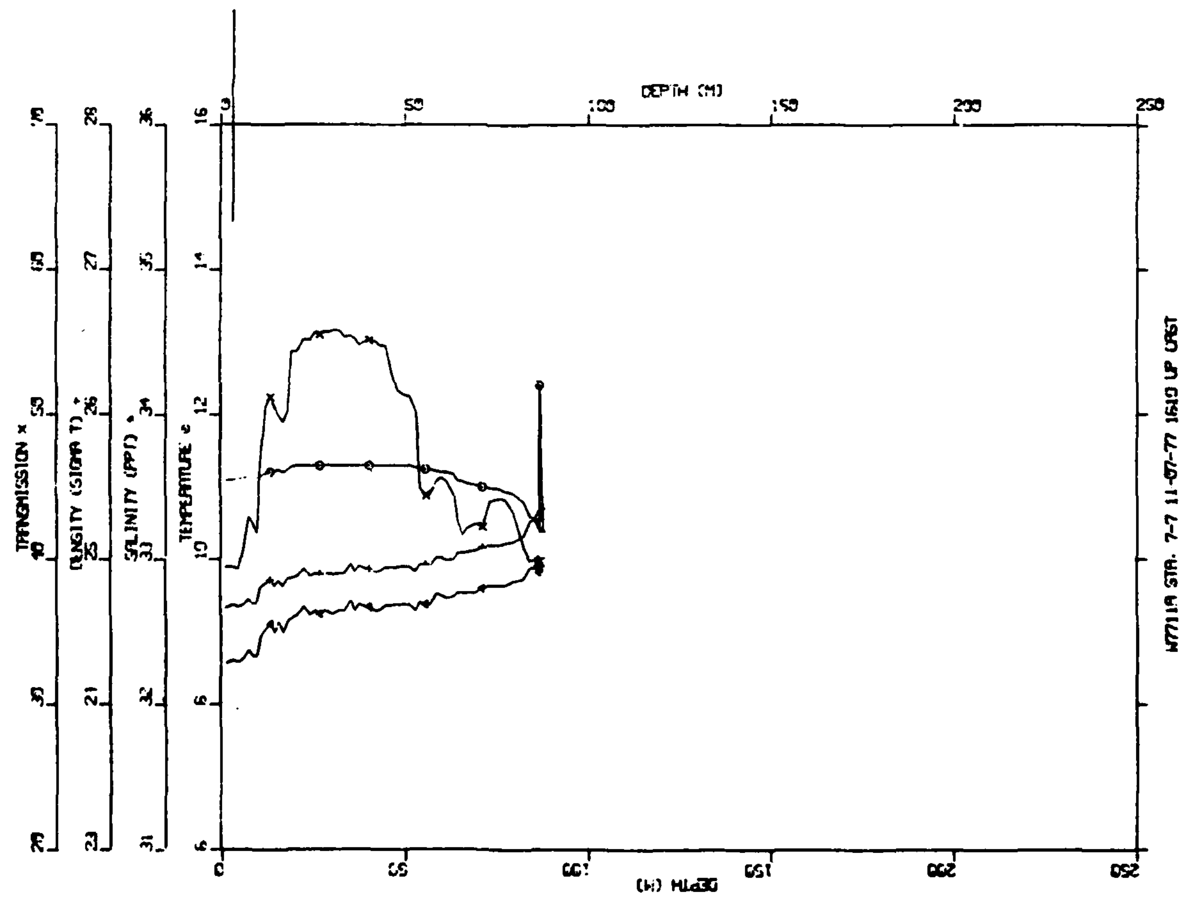

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE c
W7711A STA. 7-6 11-07-77 1445 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE c
W7711A STA. 7-6 11-07-77 1445 DN CAST

W7721A STA 7-7 11-07-77 1611 DN CAST

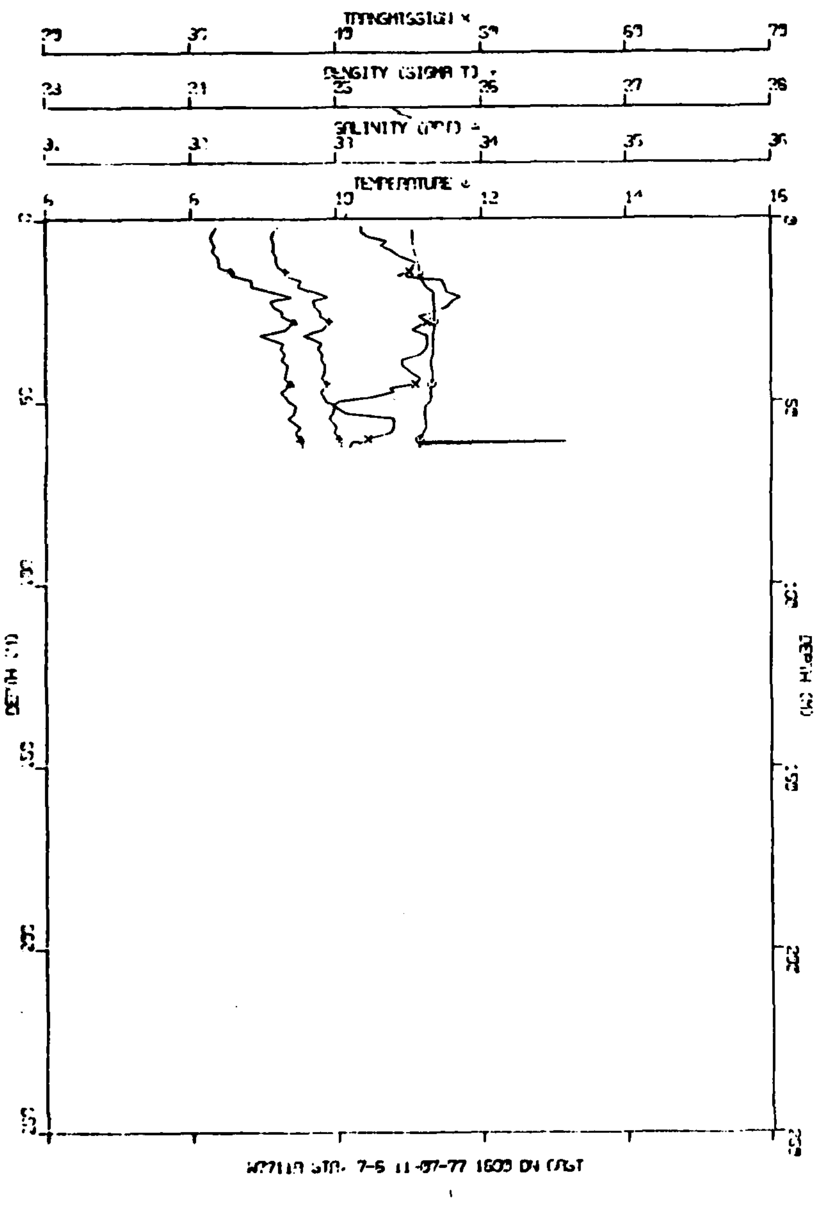
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.13	32.32	24.69	40.13
10.0	11.15	32.40	24.75	44.40
15.0	11.23	32.53	24.84	50.32
20.0	11.29	32.61	24.89	53.83
25.0	11.31	32.64	24.91	55.45
30.0	11.32	32.64	24.91	55.78
35.0	11.30	32.69	24.94	55.42
40.0	11.30	32.68	24.94	55.12
45.0	11.30	32.68	24.95	54.26
50.0	11.30	32.70	24.96	51.30
60.0	11.22	32.76	25.02	45.59
70.0	11.03	32.80	25.08	42.57
80.0	10.88	32.86	25.15	42.58
88.2	10.40	33.02	25.36	39.67

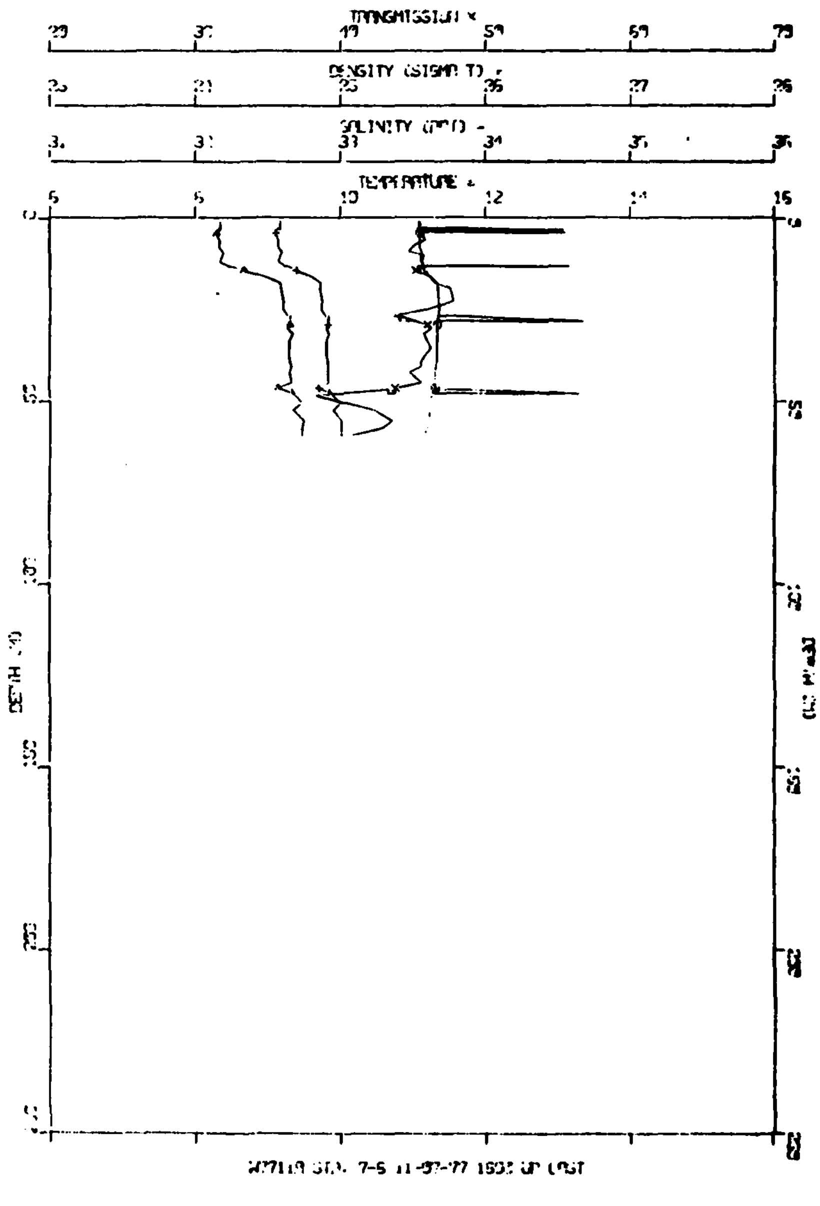

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ◊
TEMPERATURE ◊
W7711A STA. 7-7 11-07-77 1510 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ◊
TEMPERATURE ◊
W7711A STA. 7-7 11-07-77 1610 UP CAST

W7711A STA 7-8 11-7-77 1800 DN CAST

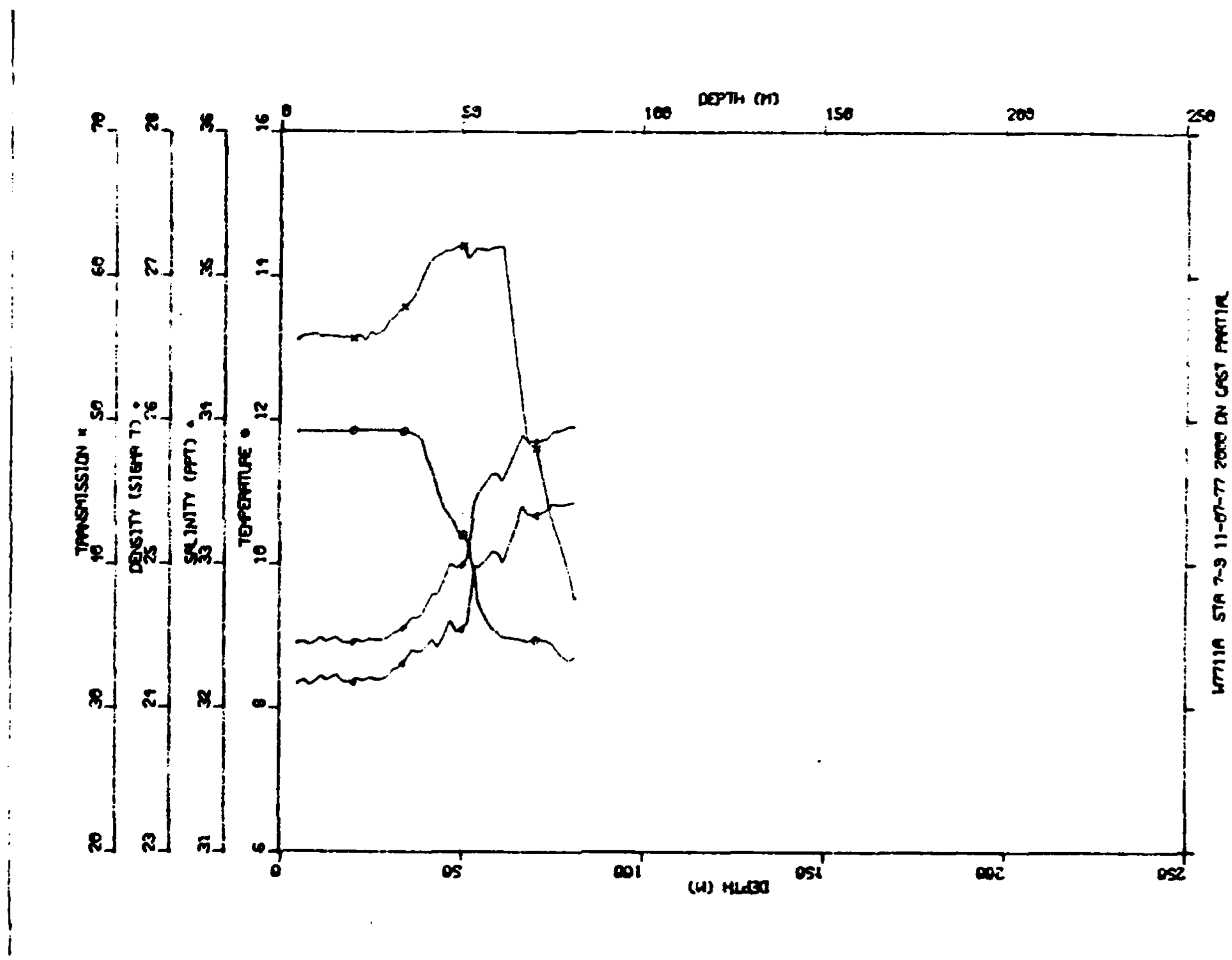
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.07	32.15	24.57	42.65
10.0	11.12	32.18	24.59	44.52
15.0	11.17	32.30	24.67	45.15
20.0	11.32	32.58	24.86	43.60
25.0	11.36	32.62	24.88	46.81
30.0	11.35	32.63	24.89	45.77
35.0	11.34	32.62	24.89	46.18
40.0	11.33	32.66	24.92	44.85
45.0	11.33	32.67	24.93	45.11
50.0	11.27	32.69	24.95	40.57
60.0	11.17	32.75	25.02	42.48
62.3	11.15	32.77	25.04	41.00


TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
DEPTH (M)
W7711A STN. 7-5 11-07-77 1609 DN CAST


TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
DEPTH (M)
W7711A STN. 7-5 11-07-77 1609 UP CAST

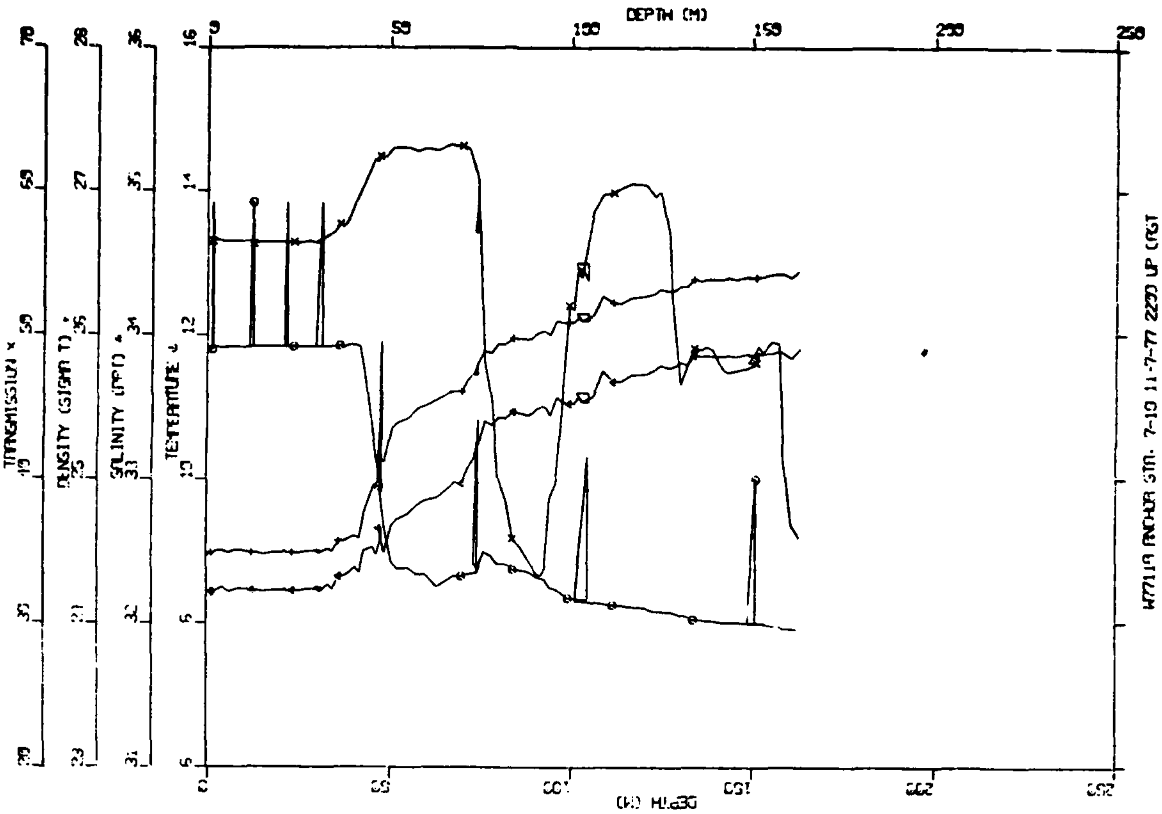
W77[illegible]1A STA 7-9 11-07-77 2000 DN CAST

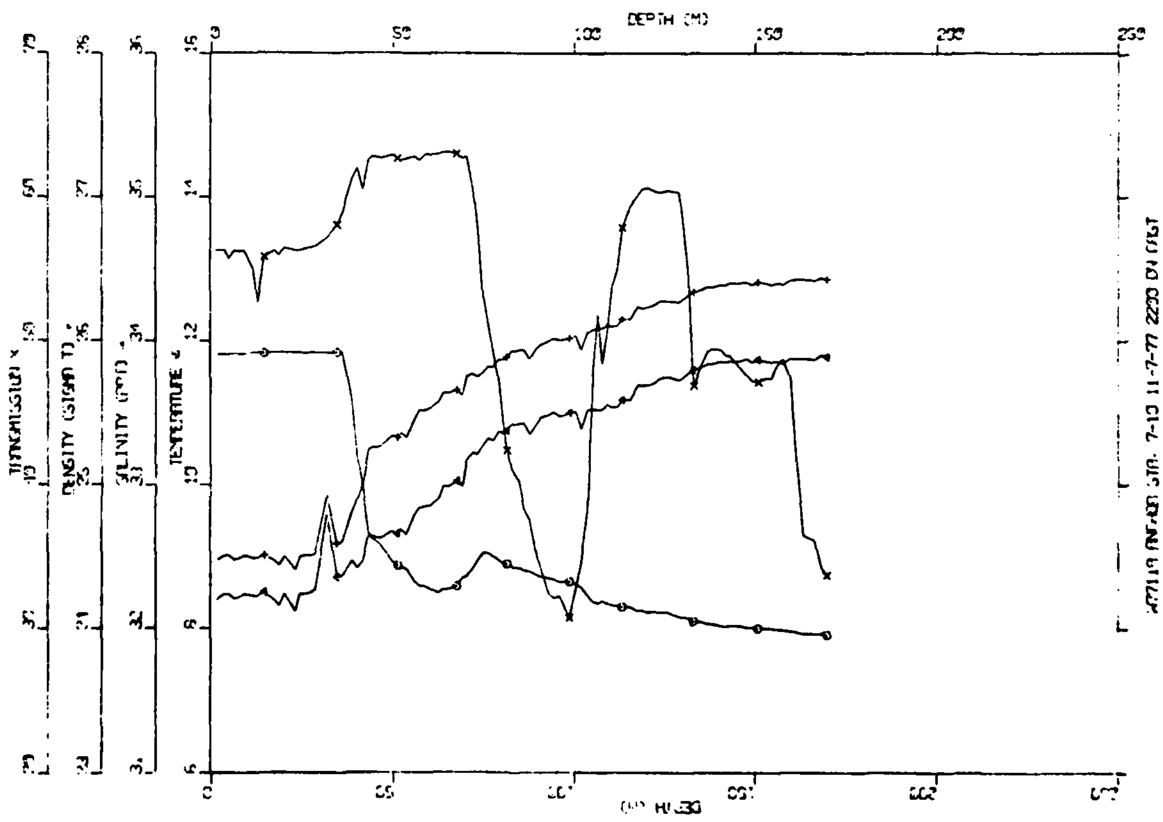
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.84	32.18	24.45	55.84
10.0	11.84	32.19	24.46	55.90
15.0	11.84	32.21	24.47	55.79
20.0	11.85	32.19	24.46	55.76
25.0	11.86	32.20	24.47	55.95
30.0	11.86	32.23	24.49	56.79
35.0	11.83	32.34	24.58	58.17
40.0	11.56	32.42	24.70	60.49
45.0	10.85	32.50	24.88	61.68
50.0	10.41	32.56	25.00	61.88
60.0	9.06	33.07	25.62	62.04
70.0	8.95	33.35	25.86	47.81
80.0	8.70	33.42	25.95	39.35
90.0	8.68	33.71	26.18	35.40
74.3	8.92	33.33	25.84	42.35


DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W77[illegible]1A STA 7-10 11-7-77 2200 DN CAST

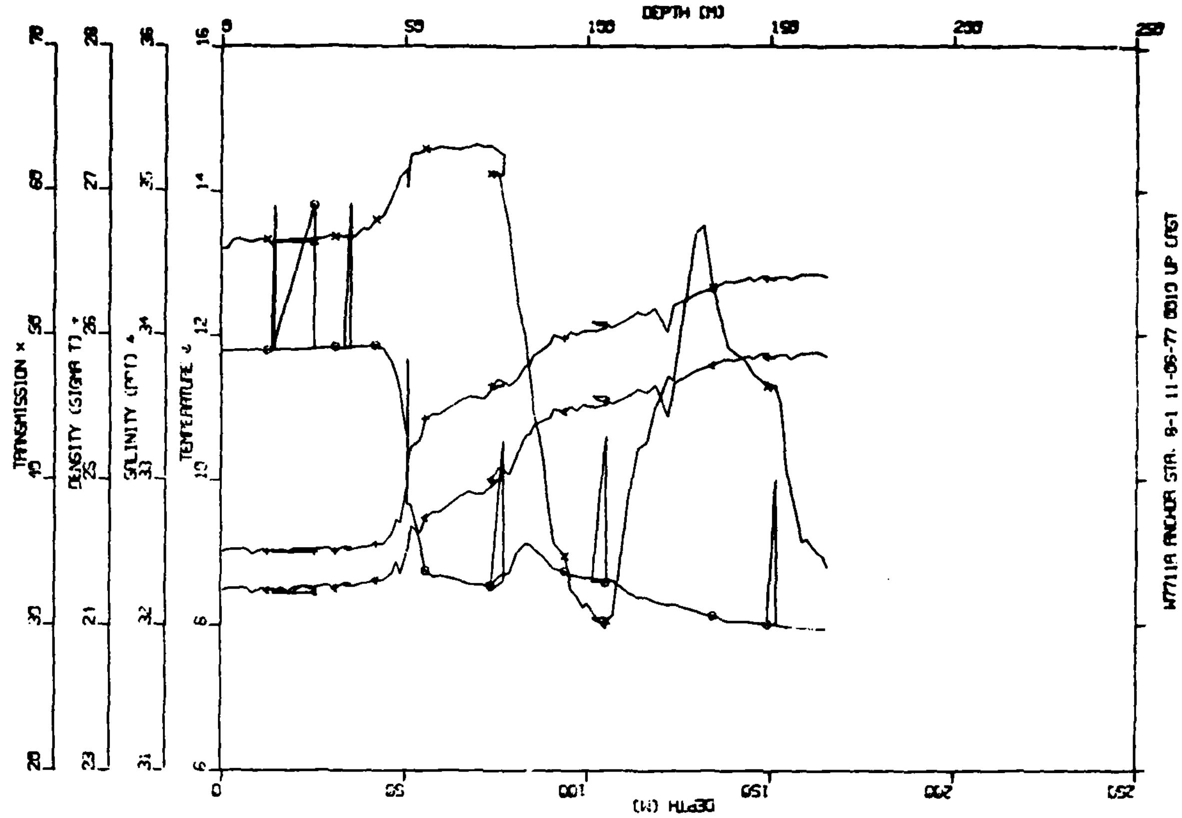
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.82	32.23	24.50	56.02
10.0	11.83	32.23	24.50	55.52
15.0	11.84	32.23	24.50	55.31
20.0	11.84	32.19	24.46	56.27
25.0	11.84	32.23	24.50	56.36
30.0	11.84	32.47	24.67	56.98
35.0	11.80	32.45	24.67	58.44
40.0	10.52	32.45	24.89	61.41
45.0	9.23	32.64	25.26	62.78
50.0	8.95	32.66	25.33	62.80
60.0	8.56	32.86	25.54	62.98
70.0	8.74	33.13	25.71	62.35
80.0	8.93	33.36	25.87	45.29
90.0	8.75	33.44	25.96	34.89
100.0	8.63	33.49	26.01	32.44
110.0	8.35	33.55	26.11	52.22
120.0	8.24	33.70	26.24	60.56
130.0	8.17	33.76	26.30	57.41
140.0	8.05	33.85	26.39	49.34
150.0	8.02	33.86	26.40	47.28
160.0	7.97	33.87	26.42	45.85
170.0	7.92	33.89	26.43	33.86

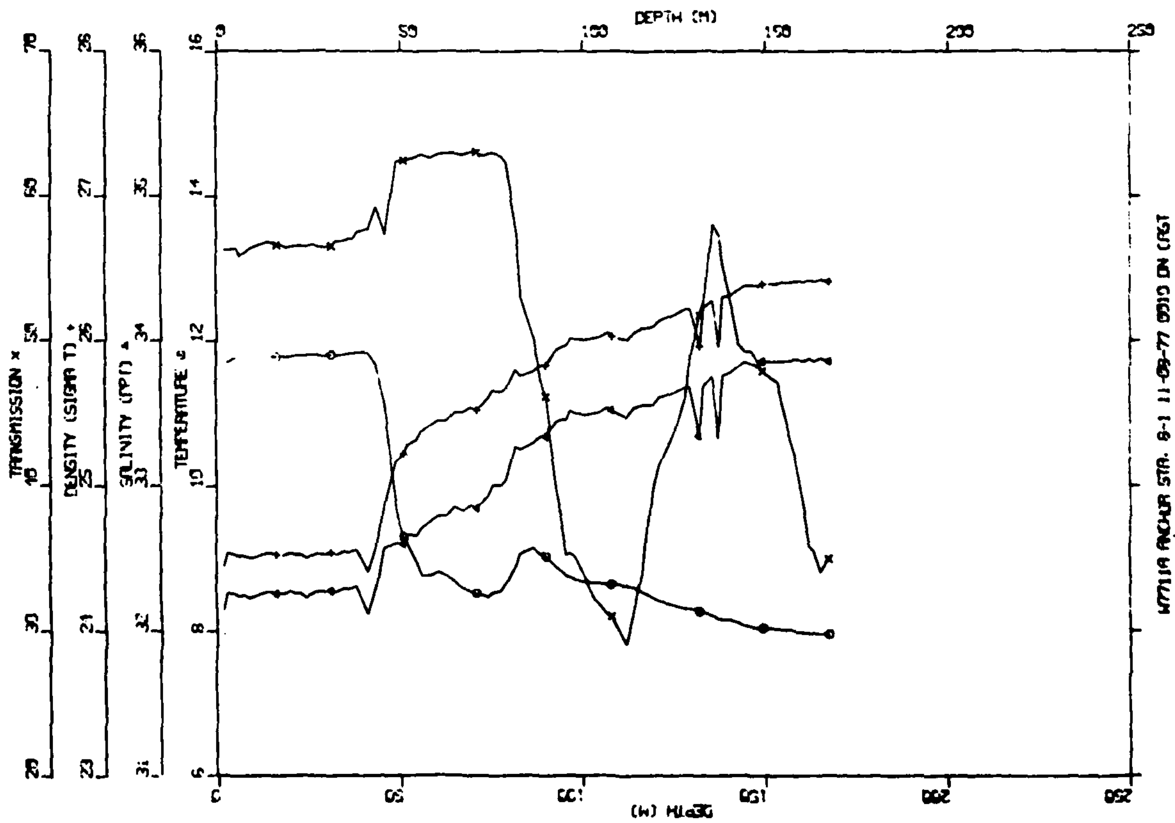

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W77[illegible]1A STA 8-1 11-08-77 0010 DN CAST

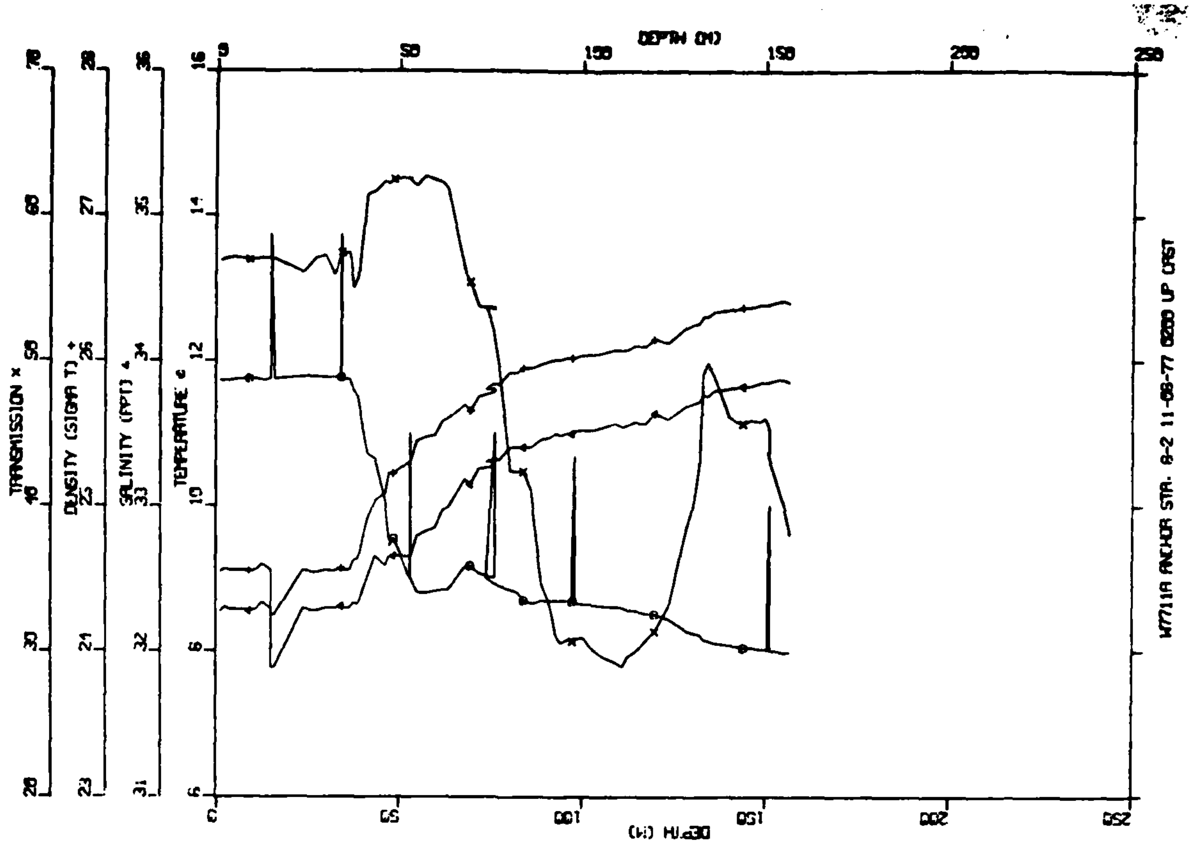
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.75	32.26	24.53	54.90
10.0	11.78	32.24	24.52	56.53
15.0	11.78	32.27	24.54	56.71
20.0	11.79	32.27	24.54	56.55
25.0	11.80	32.25	24.51	56.57
30.0	11.80	32.28	24.54	56.54
35.0	11.82	32.29	24.54	56.99
40.0	11.82	32.23	24.50	57.85
45.0	11.10	32.46	24.81	58.90
50.0	9.62	32.61	25.18	61.90
60.0	8.80	32.78	25.44	62.83
70.0	8.55	32.87	25.54	63.00
80.0	8.75	33.13	25.72	60.17
90.0	9.00	33.37	25.86	44.86
100.0	8.69	33.50	26.01	33.92
110.0	8.64	33.51	26.03	30.38
120.0	8.45	33.58	26.12	40.03
130.0	8.29	33.59	26.15	49.15
140.0	8.15	33.89	26.40	53.37
150.0	8.04	33.85	26.39	47.81
160.0	7.99	33.87	26.41	39.48
167.6	7.96	33.87	26.41	34.71

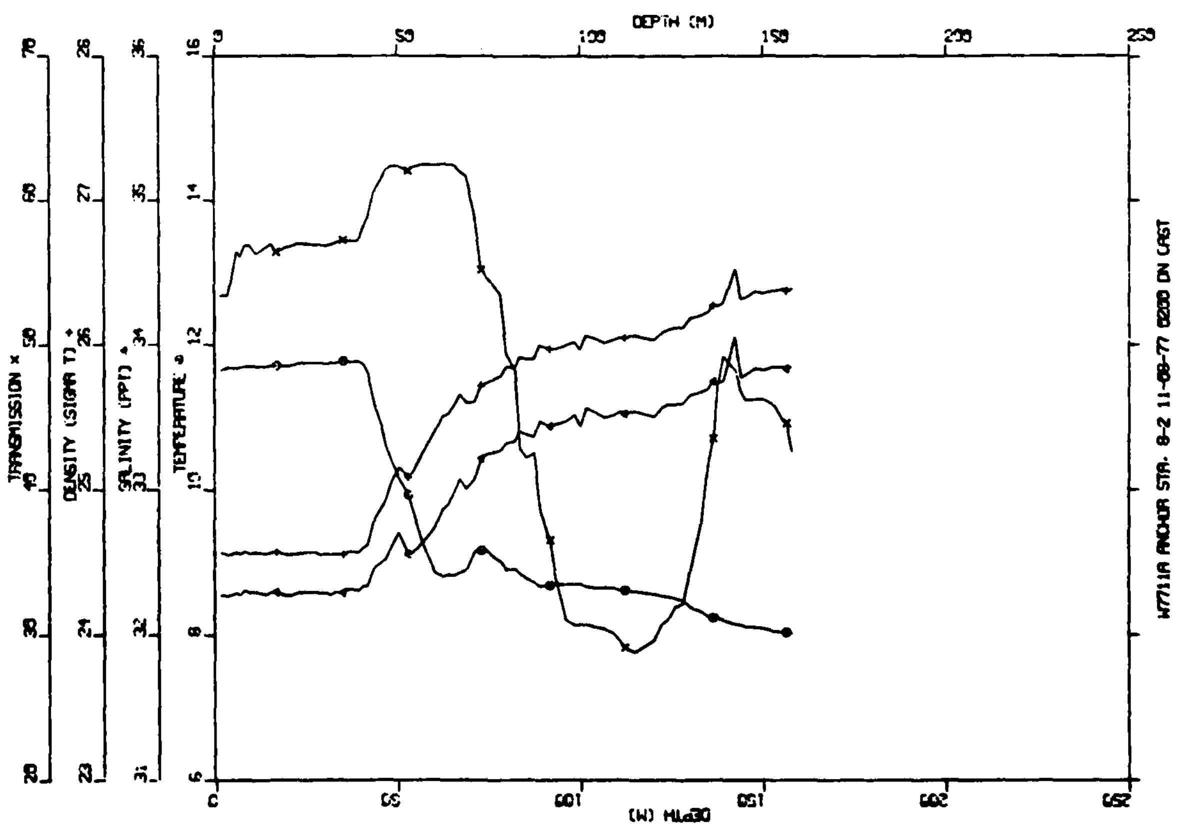

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ○
W7711A ANCHOR STA. 8-1 11-06-77 0010 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ○
W7711A ANCHOR STA. 8-1 11-06-77 0010 DN CAST

W7711A STA 8-2 11-08-77 0200 DN CAST

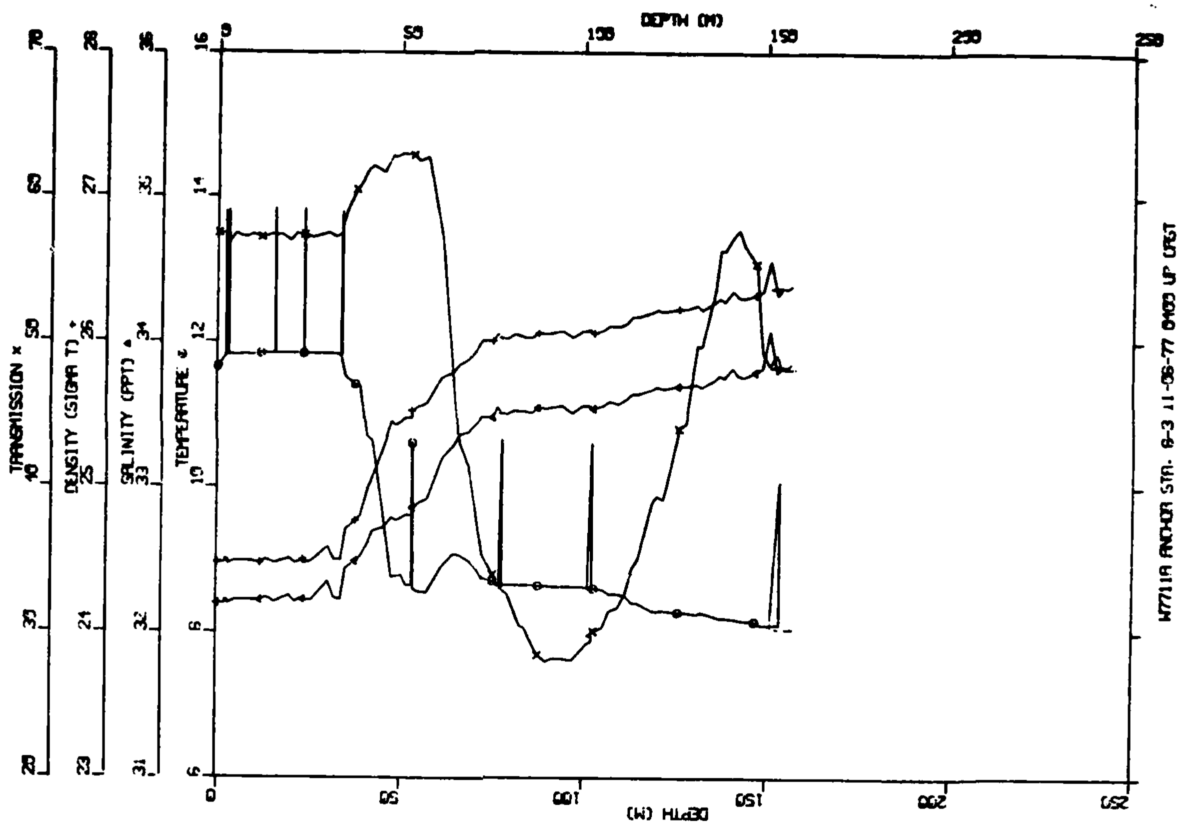
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.69	32.28	24.56	55.11
10.0	11.71	32.30	24.57	56.73
15.0	11.72	32.30	24.57	56.79
20.0	11.72	32.28	24.56	56.78
25.0	11.75	32.30	24.57	57.01
30.0	11.75	32.29	24.56	56.93
35.0	11.77	32.30	24.56	57.21
40.0	11.74	32.33	24.59	57.83
45.0	11.02	32.48	24.84	61.09
50.0	10.22	32.64	25.10	62.33
60.0	8.96	32.75	25.39	62.48
70.0	9.04	33.08	25.63	59.86
80.0	8.94	33.33	25.85	49.73
90.0	8.70	33.46	25.98	38.06
100.0	8.70	33.49	26.01	30.74
110.0	8.64	33.53	26.05	29.85
120.0	8.57	33.54	26.06	29.73
130.0	8.40	33.65	26.18	34.49
140.0	8.19	33.85	26.37	48.41
150.0	8.09	33.84	26.37	46.20
157.8	8.03	33.85	26.39	43.22

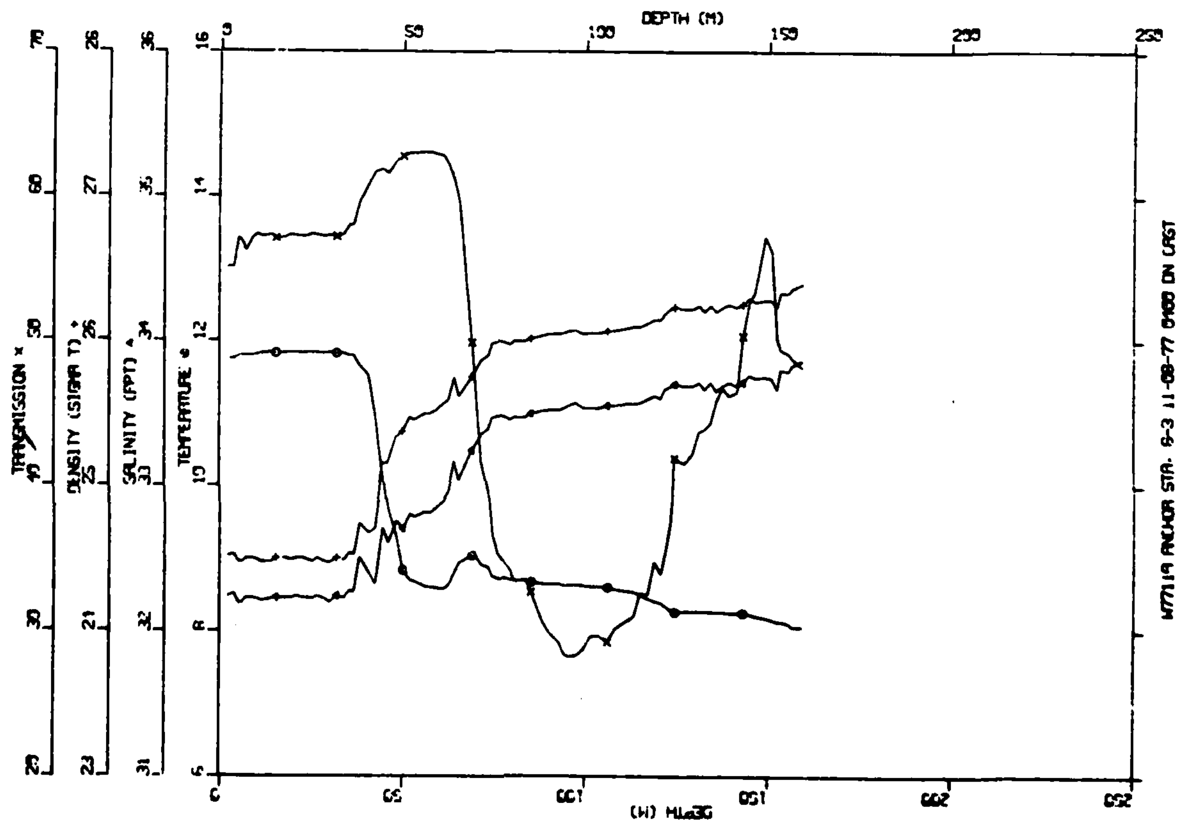

W7711A ANCHOR STA. 8-2 11-08-77 0200 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ◆
TEMPERATURE ●


W7711A ANCHOR STA. 8-2 11-08-77 0200 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ◆
TEMPERATURE ●

W7711A STA 8-3 11-08-77 0400 DN CAST

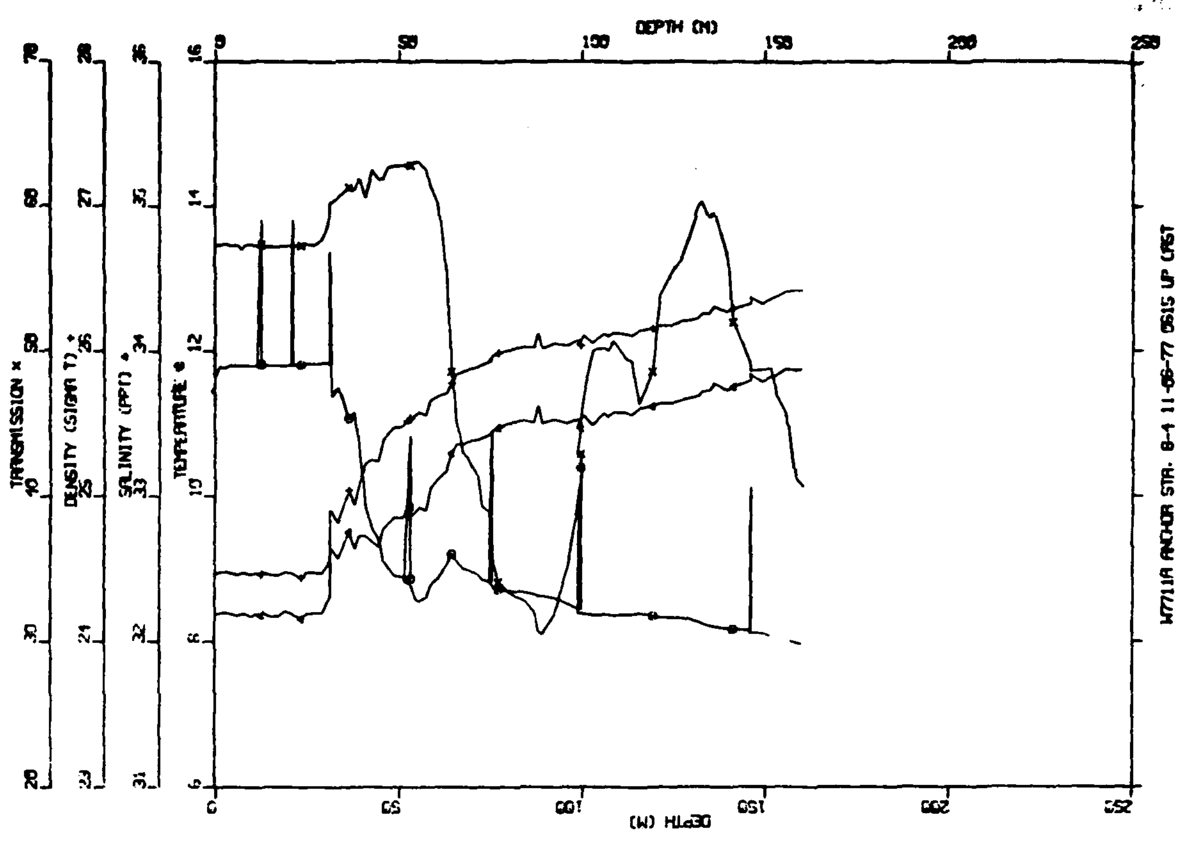
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.79	32.21	24.49	56.59
10.0	11.82	32.22	24.49	57.30
15.0	11.83	32.23	24.50	57.17
20.0	11.84	32.24	24.50	57.30
25.0	11.84	32.23	24.49	57.37
30.0	11.84	32.22	24.48	57.29
35.0	11.81	32.27	24.53	57.82
40.0	11.49	32.41	24.69	60.56
45.0	10.06	32.62	25.11	61.84
50.0	8.92	32.75	25.40	62.78
60.0	8.61	32.88	25.55	62.85
70.0	9.02	33.30	25.81	46.26
80.0	8.71	33.48	26.00	33.85
90.0	8.65	33.53	26.05	30.03
100.0	8.63	33.55	26.06	29.07
110.0	8.57	33.57	26.09	30.41
120.0	8.40	33.63	26.16	34.29
130.0	8.28	33.71	26.24	42.86
140.0	8.26	33.71	26.25	46.77
150.0	8.18	33.75	26.29	55.52
159.4	8.07	33.86	26.39	48.40

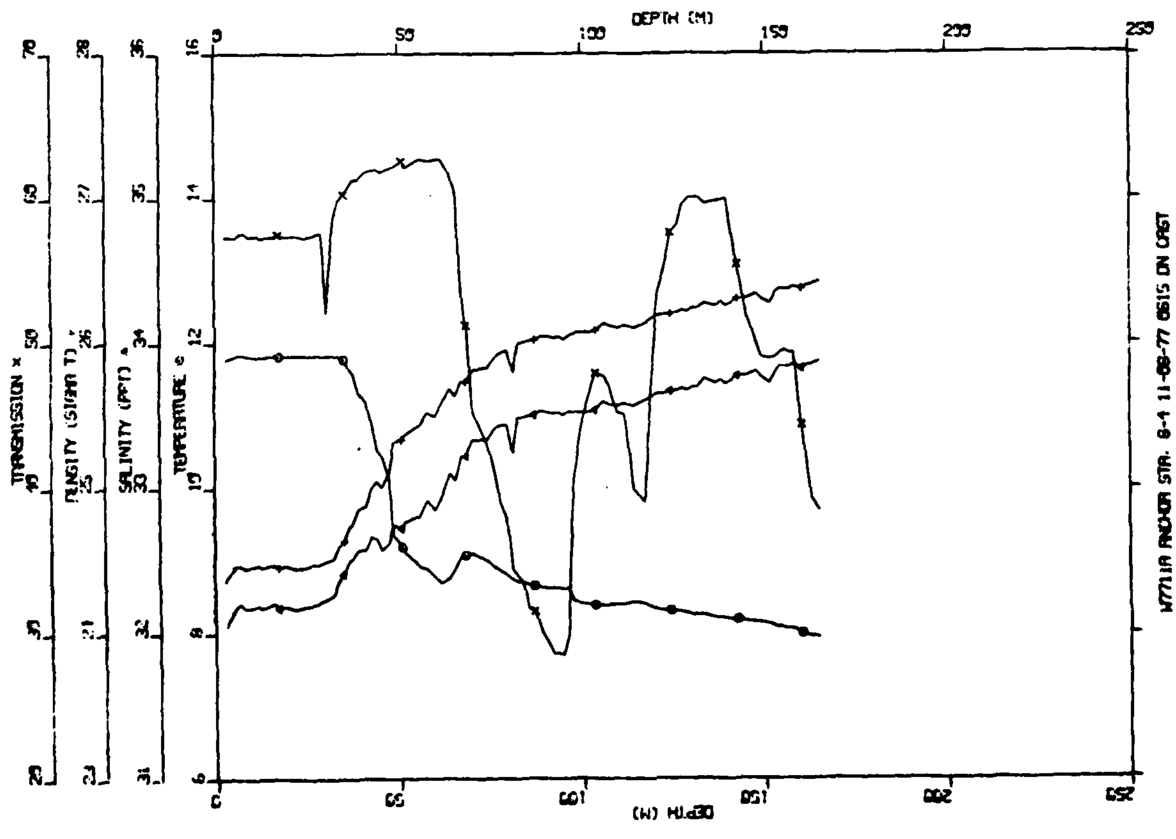

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▵
TEMPERATURE ⊙
W7711A ANCHOR STA. 6-3 11-08-77 0400 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▵
TEMPERATURE ⊙
W7711A ANCHOR STA. 6-3 11-08-77 0400 DN CAST

W7711A STA 8-4 11-08-77 0615 DN CAST

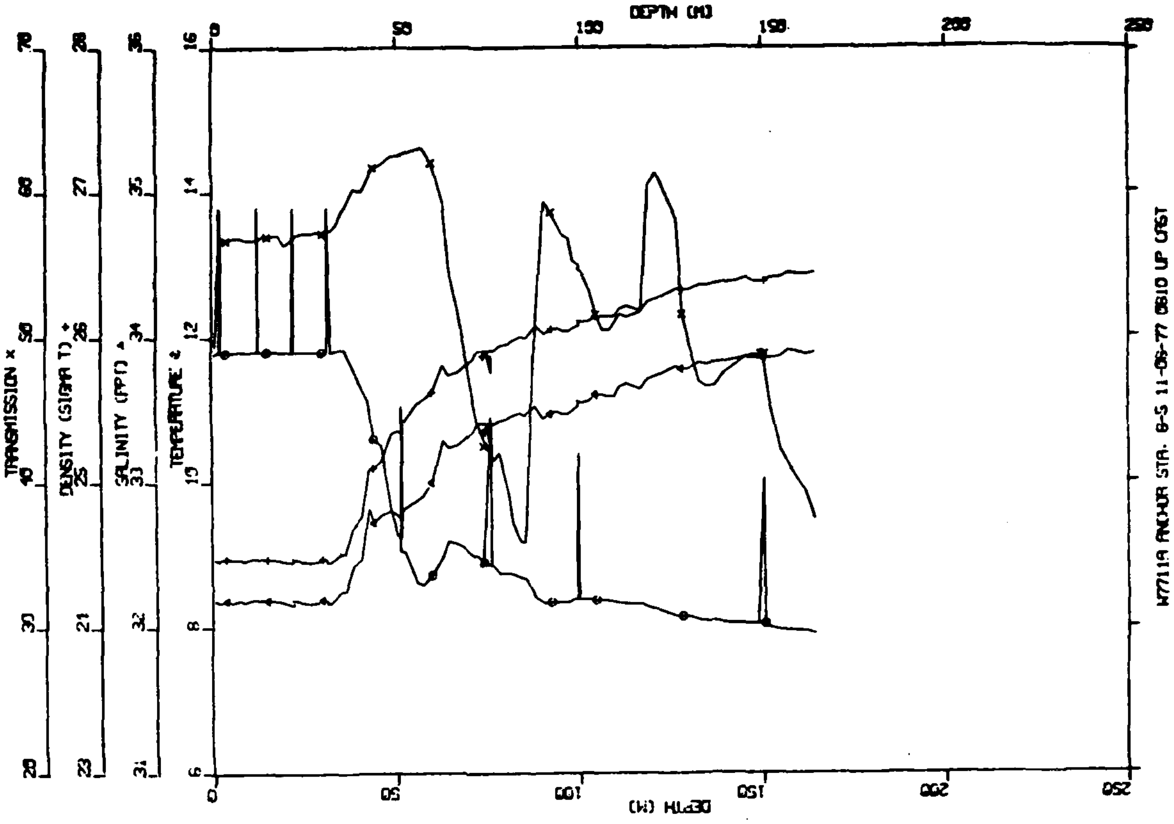
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.82	32.15	24.44	57.41
10.0	11.83	32.19	24.46	57.46
15.0	11.83	32.20	24.47	57.38
20.0	11.84	32.18	24.46	57.44
25.0	11.84	32.19	24.47	57.40
30.0	11.84	32.25	24.50	55.24
35.0	11.77	32.42	24.66	60.39
40.0	11.24	32.59	24.88	61.63
45.0	10.44	32.62	25.05	61.95
50.0	9.31	32.74	25.33	62.33
60.0	8.80	32.90	25.53	62.66
70.0	9.09	33.31	25.81	46.32
80.0	8.80	33.39	25.91	36.58
90.0	8.64	33.53	26.05	29.69
100.0	8.42	33.53	26.08	44.11
110.0	8.40	33.58	26.12	45.54
120.0	8.35	33.64	26.18	49.28
130.0	8.28	33.70	26.24	59.98
140.0	8.21	33.74	26.28	58.35
150.0	8.14	33.77	26.31	49.18
160.0	8.02	33.84	26.39	45.43
165.1	7.96	33.88	26.42	38.72

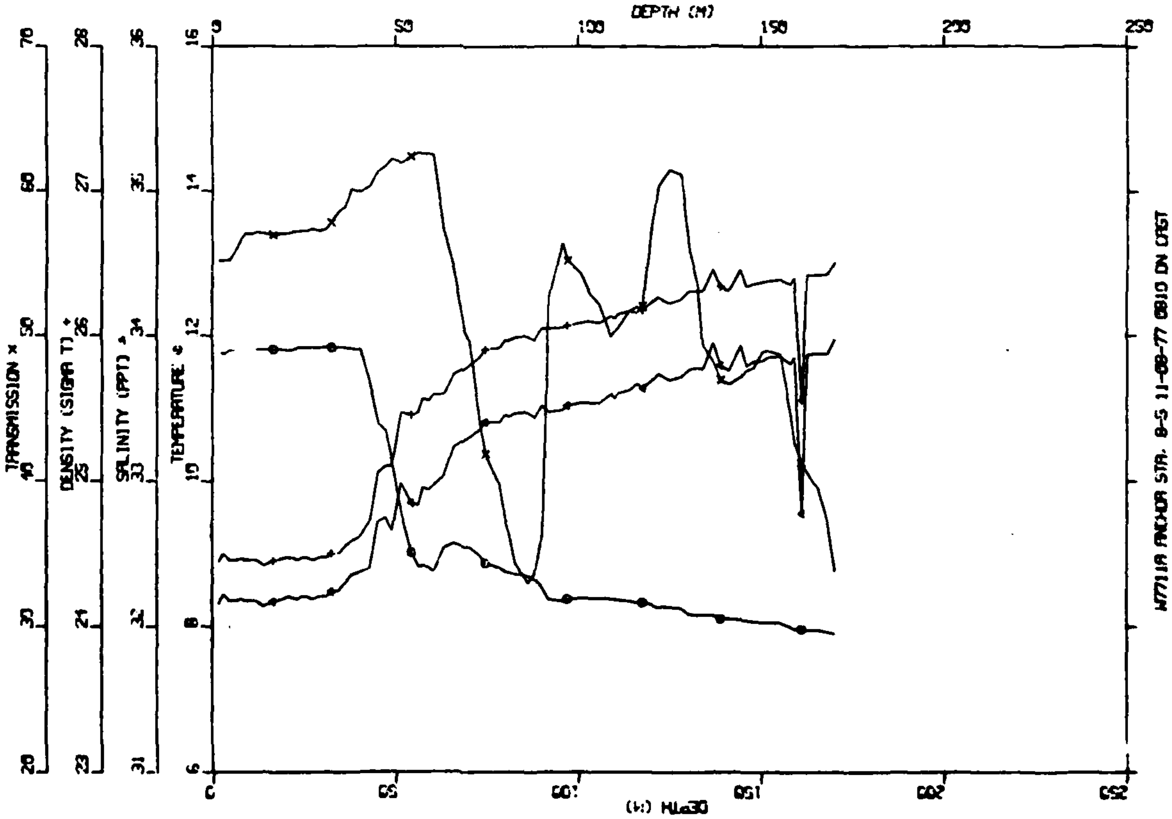

W7711A ANCHOR STA. 8-1 11-08-77 0615 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o


W7711A ANCHOR STA. 8-1 11-08-77 0615 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o

W7711A STA 8-5 11-08-77 0810 DN CAST

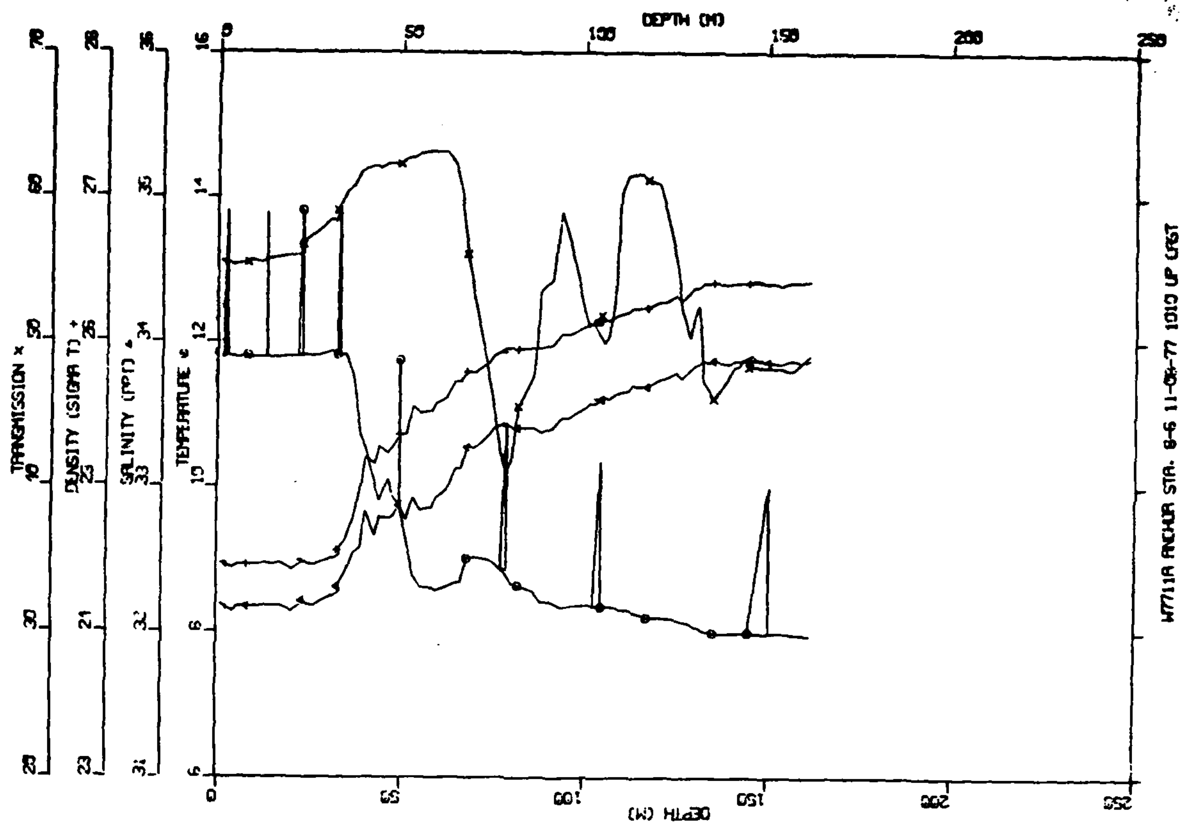
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.80	32.19	24.47	54.37
10.0	11.82	32.18	24.46	57.04
15.0	11.82	32.17	24.45	57.08
20.0	11.82	32.20	24.48	57.11
25.0	11.84	32.21	24.48	57.29
30.0	11.85	32.22	24.49	57.43
35.0	11.85	32.27	24.53	58.67
40.0	11.72	32.38	24.64	60.09
45.0	10.92	32.64	24.98	61.18
50.0	9.92	32.82	25.28	62.08
60.0	8.85	32.98	25.58	61.67
70.0	9.08	33.32	25.81	48.59
80.0	8.78	33.45	25.96	37.66
90.0	8.54	33.49	26.03	39.25
100.0	8.39	33.54	26.09	54.40
110.0	8.38	33.59	26.13	50.27
120.0	8.31	33.69	26.23	56.71
130.0	8.20	33.76	26.29	57.23
140.0	8.11	33.82	26.36	47.06
150.0	8.06	33.83	26.37	48.54
160.0	7.98	33.47	26.10	42.26
170.0	7.91	33.96	26.49	34.75
168.1	7.91	33.96	26.49	34.68

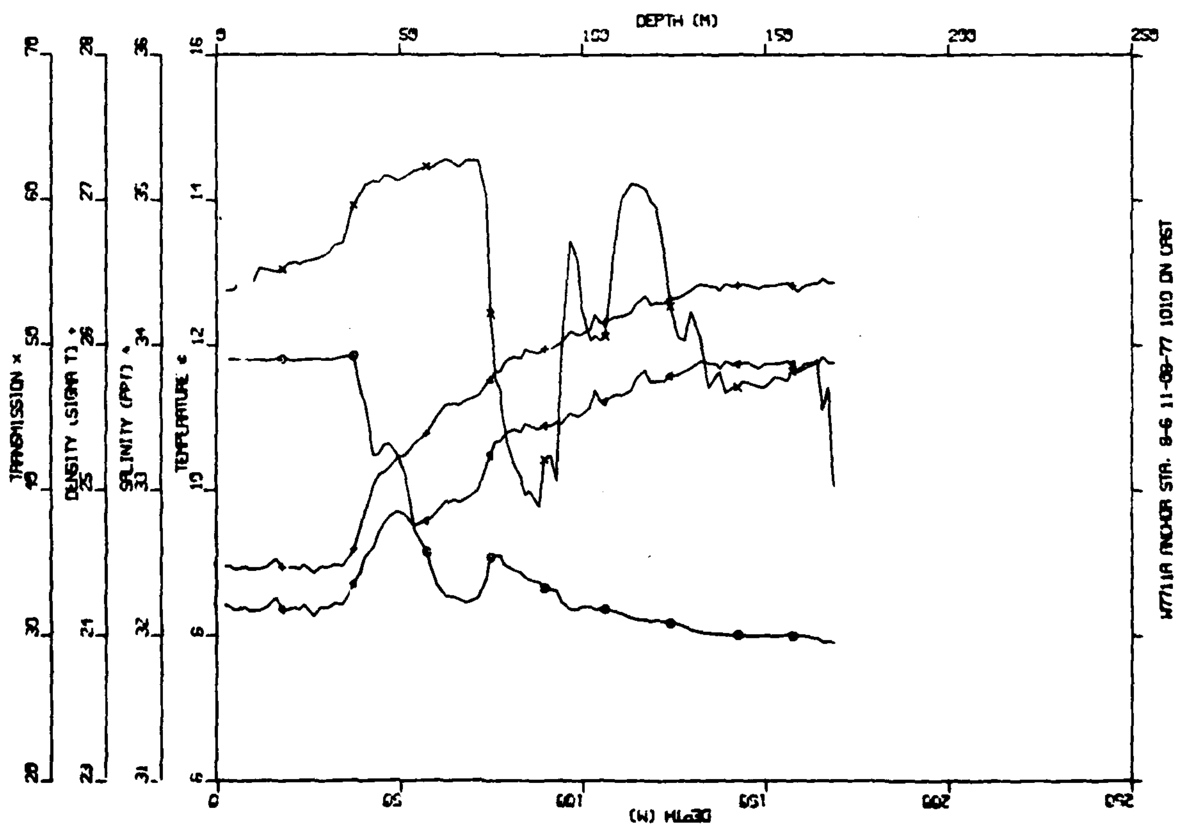

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ◆
W7718 ANCHOR STA. 8-5 11-08-77 0810 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ◆
W7718 ANCHOR STA. 8-5 11-08-77 0810 DN CAST

W7741A STA 8-6 11-08-77 1010 DN CAST

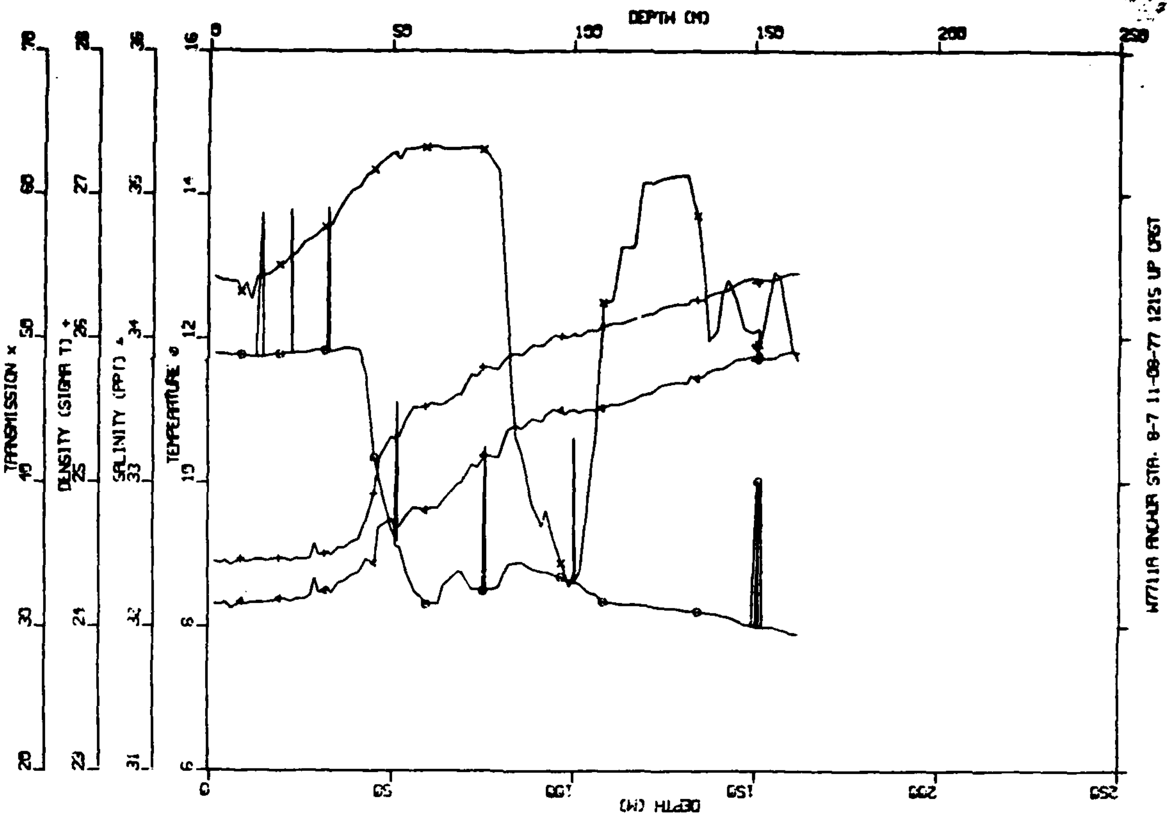
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.80	32.19	24.47	53.57
10.0	11.80	32.18	24.47	54.61
15.0	11.80	32.21	24.49	55.17
20.0	11.80	32.19	24.47	55.61
25.0	11.80	32.18	24.47	55.83
30.0	11.81	32.20	24.48	56.43
35.0	11.81	32.27	24.53	58.08
40.0	11.20	32.51	24.82	60.77
45.0	10.57	32.74	25.12	61.50
50.0	10.31	32.83	25.23	61.55
60.0	8.74	32.86	25.51	62.50
70.0	8.54	33.00	25.64	62.35
80.0	8.94	33.40	25.90	42.92
90.0	8.67	33.45	25.97	41.51
100.0	8.38	33.54	26.10	52.61
110.0	8.32	33.66	26.20	58.15
120.0	8.20	33.75	26.29	58.89
130.0	8.08	33.86	26.39	51.18
140.0	8.01	33.87	26.41	47.09
150.0	7.99	33.86	26.41	47.25
160.0	7.99	33.86	26.40	48.33
168.6	7.91	33.88	26.43	42.01

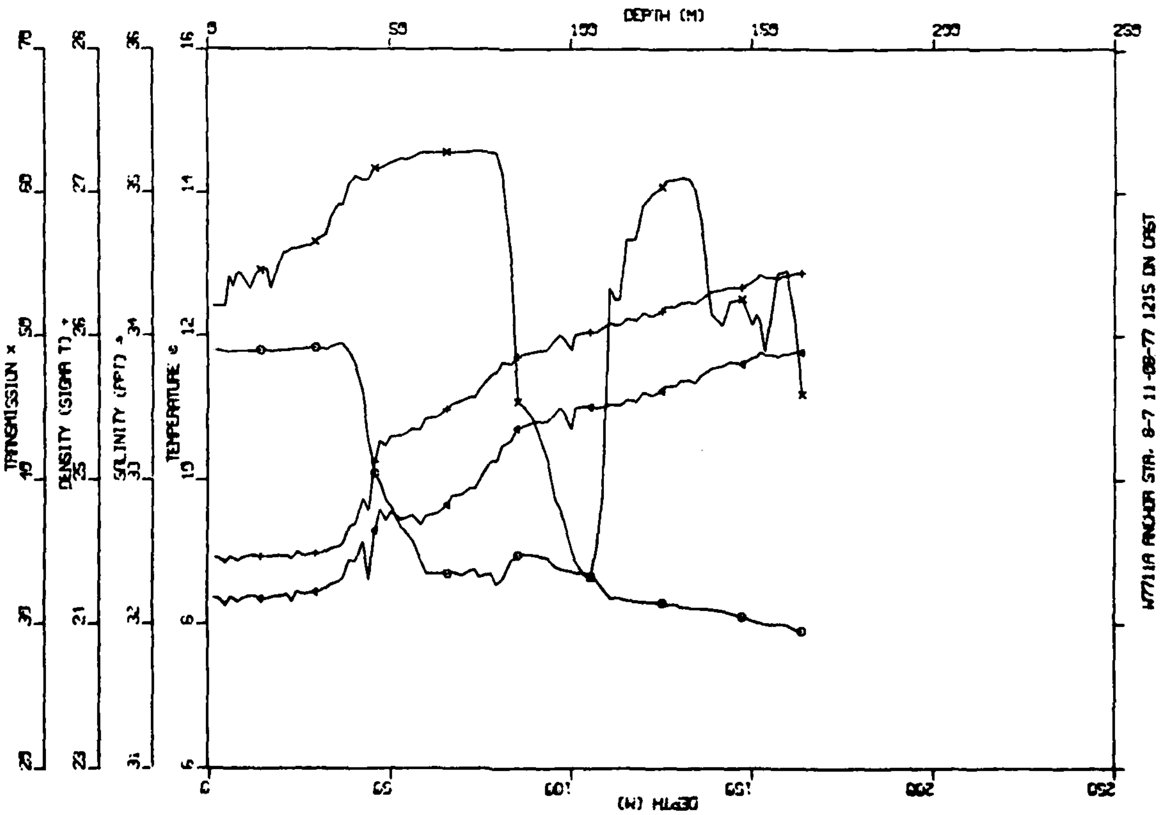

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A ANCHOR STA. 8-6 11-08-77 1010 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A ANCHOR STA. 8-6 11-08-77 1010 DN CAST

W7[illegible]1A STA 8-7 11-08-77 1215 DN CAST

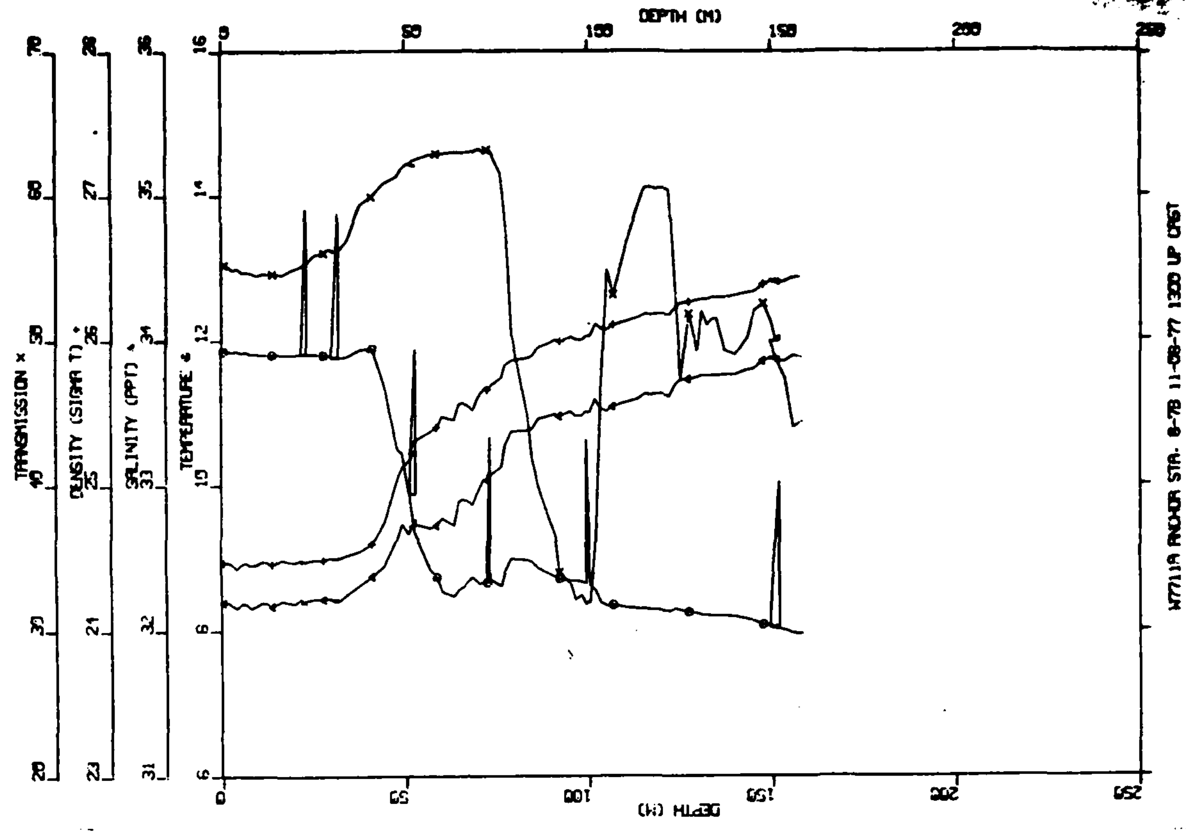
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.79	32.16	24.45	52.04
10.0	11.79	32.18	24.46	54.00
15.0	11.80	32.18	24.47	54.48
20.0	11.81	32.20	24.48	55.16
25.0	11.83	32.22	24.49	56.16
30.0	11.83	32.23	24.50	56.74
35.0	11.87	32.29	24.54	58.71
40.0	11.60	32.46	24.72	60.81
45.0	10.35	32.55	25.01	61.37
50.0	9.60	32.75	25.29	62.07
60.0	8.75	32.74	25.41	62.79
70.0	8.71	32.91	25.55	62.85
80.0	8.63	33.19	25.78	61.67
90.0	8.94	33.40	25.89	43.46
100.0	8.73	33.42	25.95	35.45
110.0	8.44	33.52	26.07	46.66
120.0	8.31	33.59	26.14	58.73
130.0	8.25	33.68	26.23	60.97
140.0	8.19	33.78	26.31	52.33
150.0	8.06	33.84	26.38	51.43
160.0	7.98	33.88	26.43	53.51
163.8	7.91	33.89	26.44	47.16

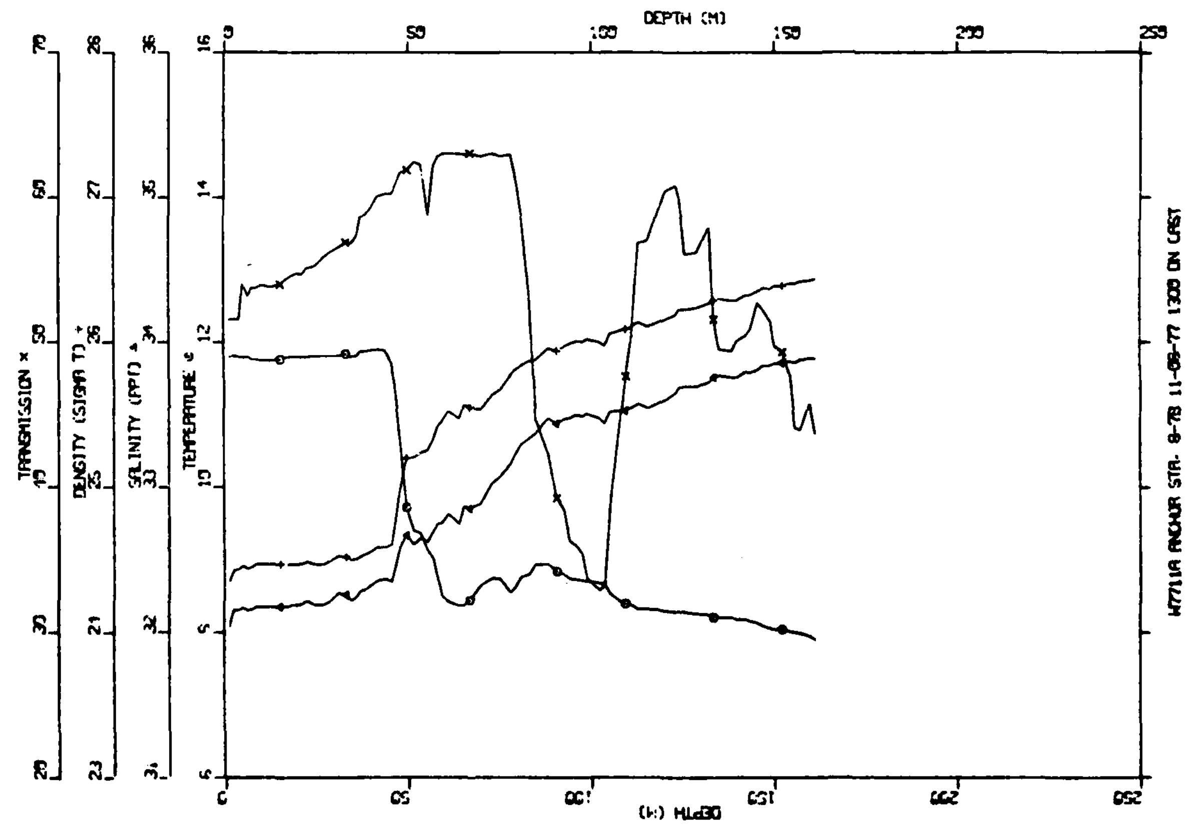

W7711A ANCHOR STA. 8-7 11-08-77 1215 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) △
TEMPERATURE ⊙


W7711A ANCHOR STA. 8-7 11-08-77 1215 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) △
TEMPERATURE ⊙

W7711A STA 8-7B 11-08-77 1300 DN CAST

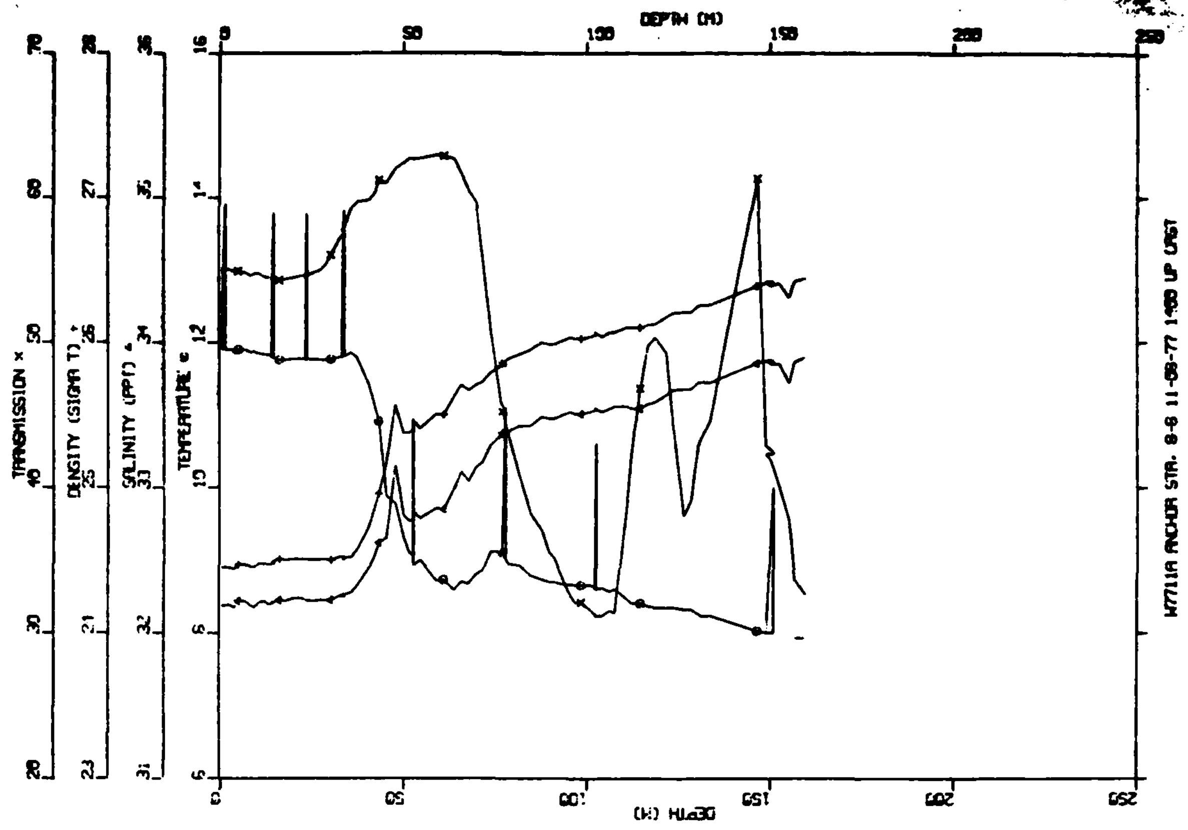
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.80	32.16	24.45	53.21
10.0	11.76	32.18	24.47	53.87
15.0	11.77	32.18	24.47	54.11
20.0	11.80	32.19	24.47	54.76
25.0	11.82	32.20	24.48	55.45
30.0	11.83	32.24	24.51	56.41
35.0	11.82	32.24	24.51	57.16
40.0	11.89	32.33	24.56	59.45
45.0	11.62	32.40	24.66	60.48
50.0	9.80	32.64	25.17	62.06
60.0	8.51	32.78	25.48	63.00
70.0	8.64	32.93	25.58	62.95
80.0	8.69	33.26	25.83	59.67
90.0	8.88	33.45	25.95	40.53
100.0	8.70	33.50	26.01	33.74
110.0	8.39	33.54	26.10	48.29
120.0	8.30	33.60	26.16	59.56
130.0	8.25	33.72	26.26	56.38
140.0	8.19	33.77	26.30	50.06
150.0	8.05	33.85	26.39	50.27
160.0	7.95	33.89	26.43	44.75
159.9	7.91	33.89	26.44	44.21

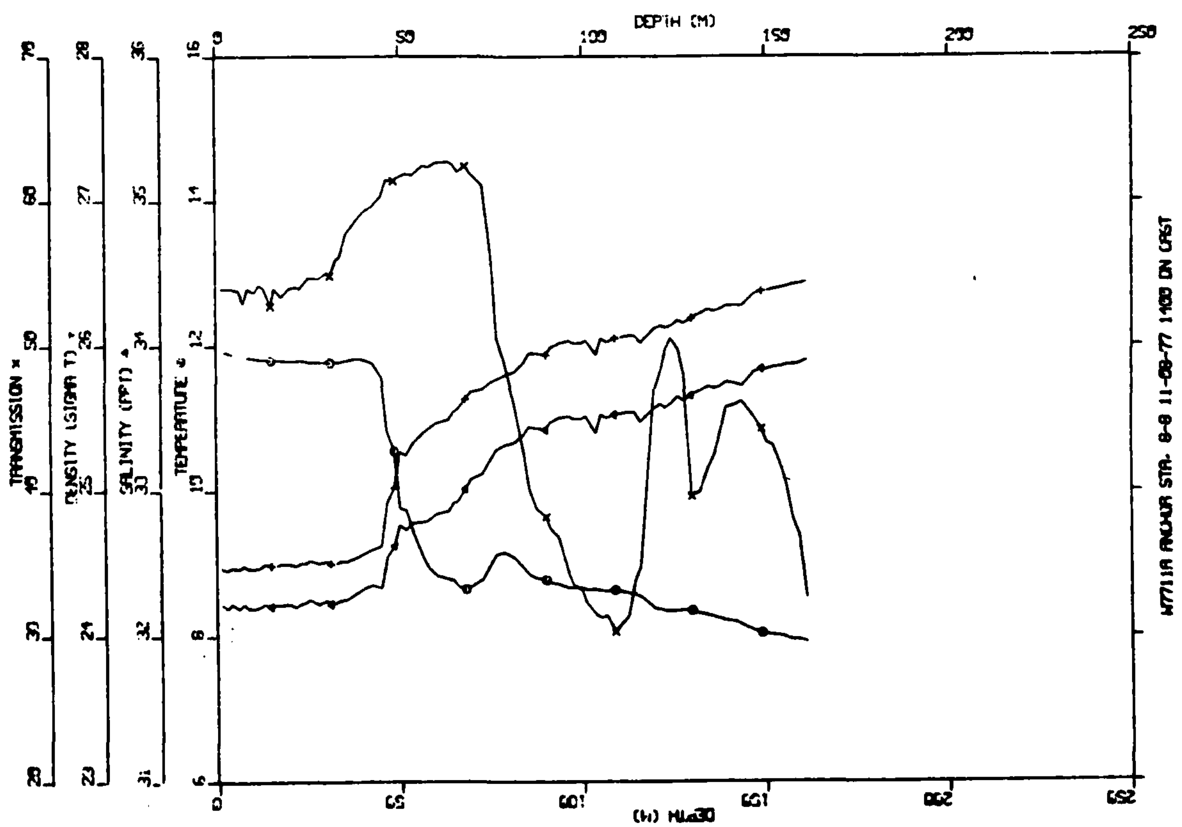

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A ANCHOR STA. 8-7B 11-08-77 1300 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A ANCHOR STA. 8-7B 11-08-77 1300 DN CAST

W7711A STA 8-8 11-08-77 1400 DN CAST

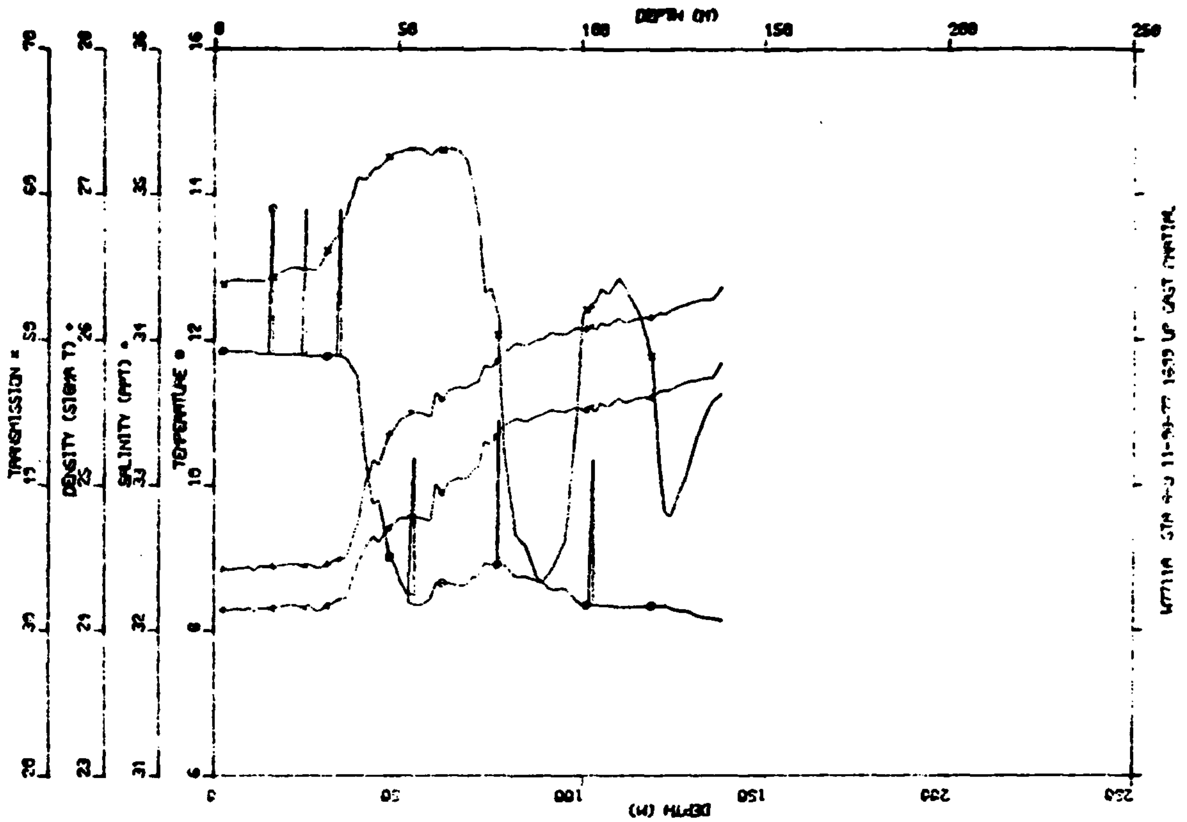
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.88	32.22	24.48	50.50
10.0	11.83	32.20	24.47	53.90
15.0	11.81	32.22	24.49	53.44
20.0	11.79	32.22	24.50	53.90
25.0	11.78	32.25	24.52	54.62
30.0	11.78	32.24	24.51	54.95
35.0	11.82	32.27	24.53	57.26
40.0	11.82	32.34	24.58	59.20
45.0	11.40	32.41	24.72	60.53
50.0	9.96	32.73	25.21	61.71
60.0	8.87	32.85	25.48	62.64
70.0	8.75	33.10	25.69	61.53
80.0	9.11	33.34	25.82	47.18
90.0	8.79	33.45	25.96	38.18
100.0	8.67	33.50	26.02	32.93
110.0	8.63	33.54	26.06	31.17
120.0	8.42	33.57	26.11	45.14
130.0	8.35	33.66	26.19	41.42
140.0	8.22	33.74	26.27	45.50
150.0	8.04	33.84	26.38	43.72
160.0	7.95	33.89	26.43	35.49
159.5	7.94	33.90	26.44	33.75

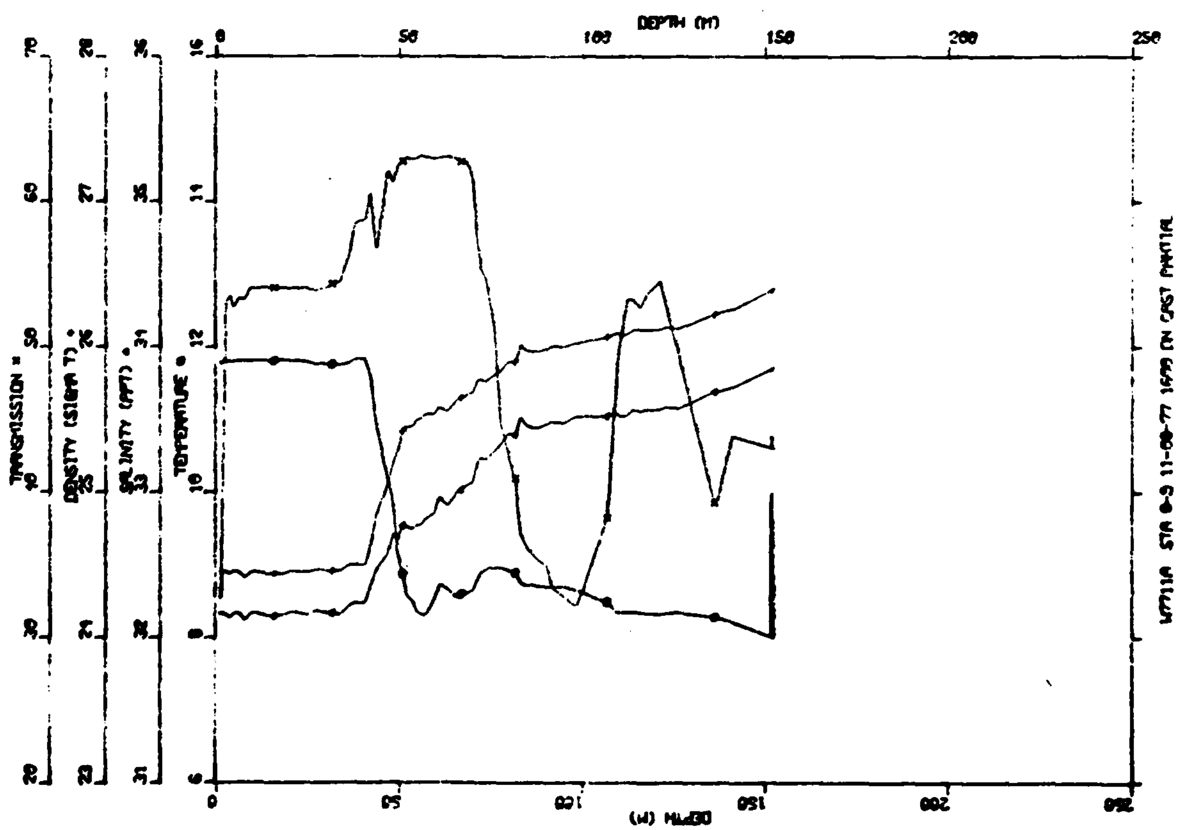

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o
W7711A ANCHOR STA. 8-8 11-08-77 1400 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o
W7711A ANCHOR STA. 8-8 11-08-77 1400 DN CAST

W7711A STA 8-9 11-08-77 1600 DN CAST

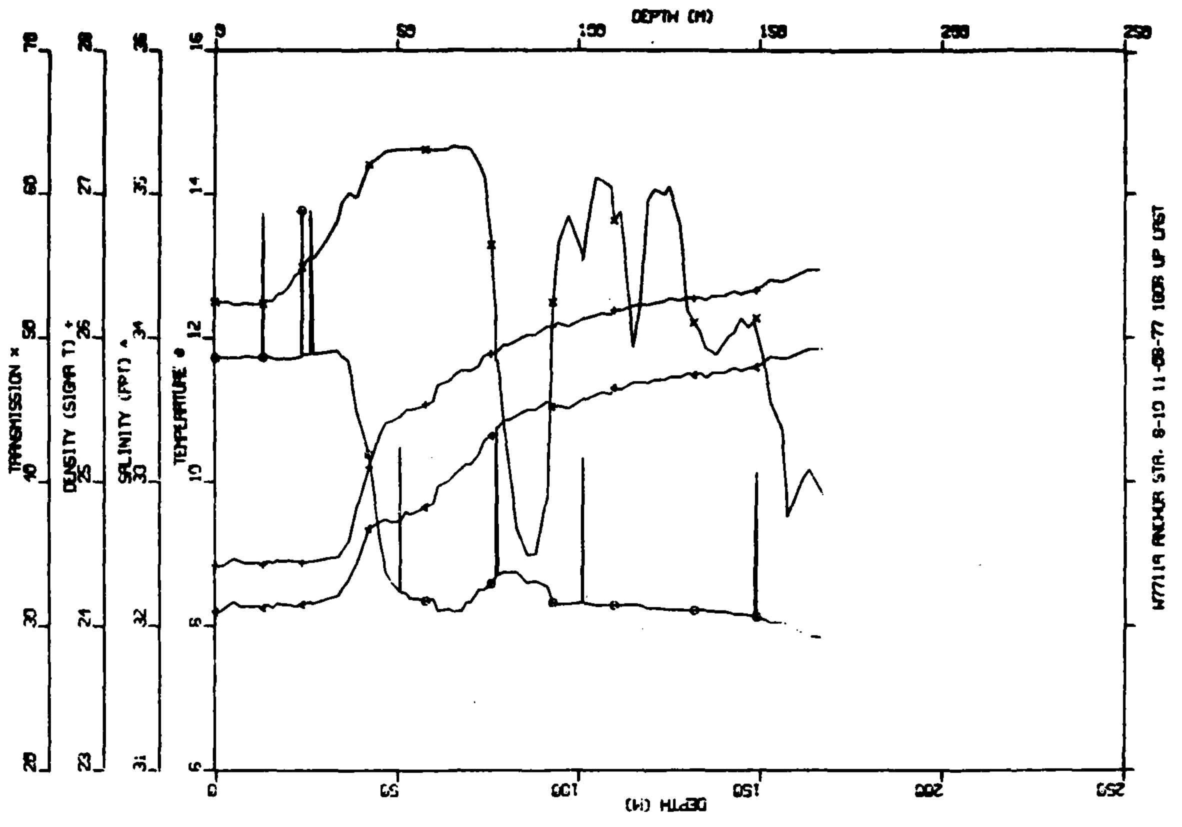
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.81	32.16	24.45	53.09
10.0	11.82	32.16	24.44	53.95
15.0	11.82	32.15	24.44	54.09
20.0	11.82	32.18	24.46	54.05
25.0	11.80	32.17	24.46	54.00
30.0	11.77	32.17	24.46	54.12
35.0	11.78	32.20	24.48	55.73
40.0	11.80	32.26	24.52	58.91
45.0	10.65	32.53	24.94	59.73
50.0	9.07	32.73	25.35	62.56
60.0	8.59	32.90	25.56	63.02
70.0	8.70	33.11	25.72	60.48
80.0	8.93	33.40	25.90	42.56
90.0	8.71	33.47	25.99	34.79
100.0	8.61	33.52	26.05	34.96
110.0	8.39	33.54	26.09	48.45
120.0	8.34	33.58	26.13	53.83
130.0	8.33	33.63	26.18	45.61
140.0	8.21	33.74	26.28	42.24
150.0	8.52	33.81	26.35	42.87
151.4	8.52	33.85	26.39	43.60


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE

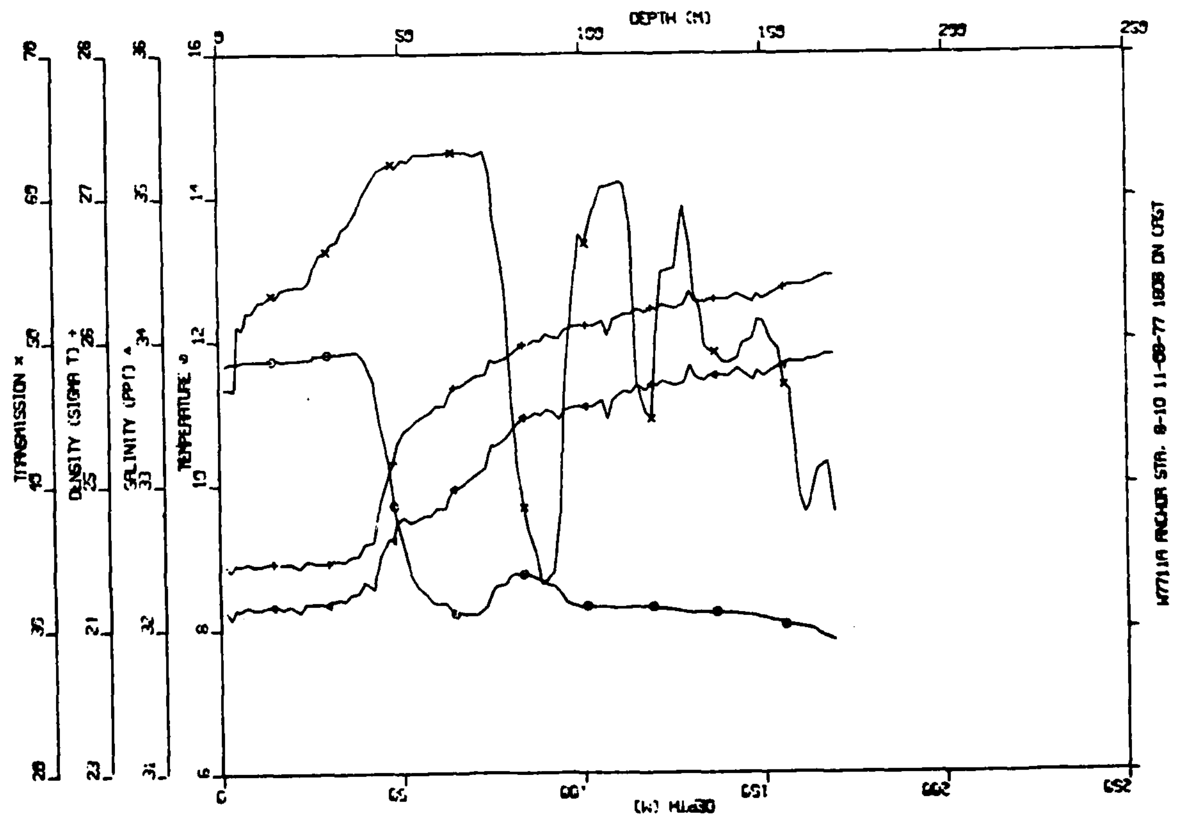

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE

W7[illegible]1A STA 8-10 11-10-77 1808 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.72	32.14	24.45	49.92
10.0	11.73	32.15	24.45	52.43
15.0	11.74	32.16	24.46	53.17
20.0	11.74	32.15	24.45	53.80
25.0	11.77	32.18	24.47	54.47
30.0	11.82	32.19	24.47	56.45
35.0	11.84	32.22	24.49	58.02
40.0	11.65	32.31	24.59	60.30
45.0	10.61	32.53	24.95	61.98
50.0	9.23	32.75	25.34	62.40
60.0	8.36	32.84	25.55	63.09
70.0	8.23	33.06	25.75	63.05
80.0	8.72	33.37	25.91	48.08
90.0	8.64	33.52	26.03	33.53
100.0	8.32	33.55	26.11	56.52
110.0	8.29	33.61	26.16	60.97
120.0	8.30	33.70	26.23	48.69
130.0	8.22	33.78	26.30	56.43
140.0	8.22	33.77	26.30	48.58
150.0	8.15	33.77	26.31	51.02
160.0	8.04	33.85	26.39	40.58
169.3	7.85	33.91	26.46	39.01



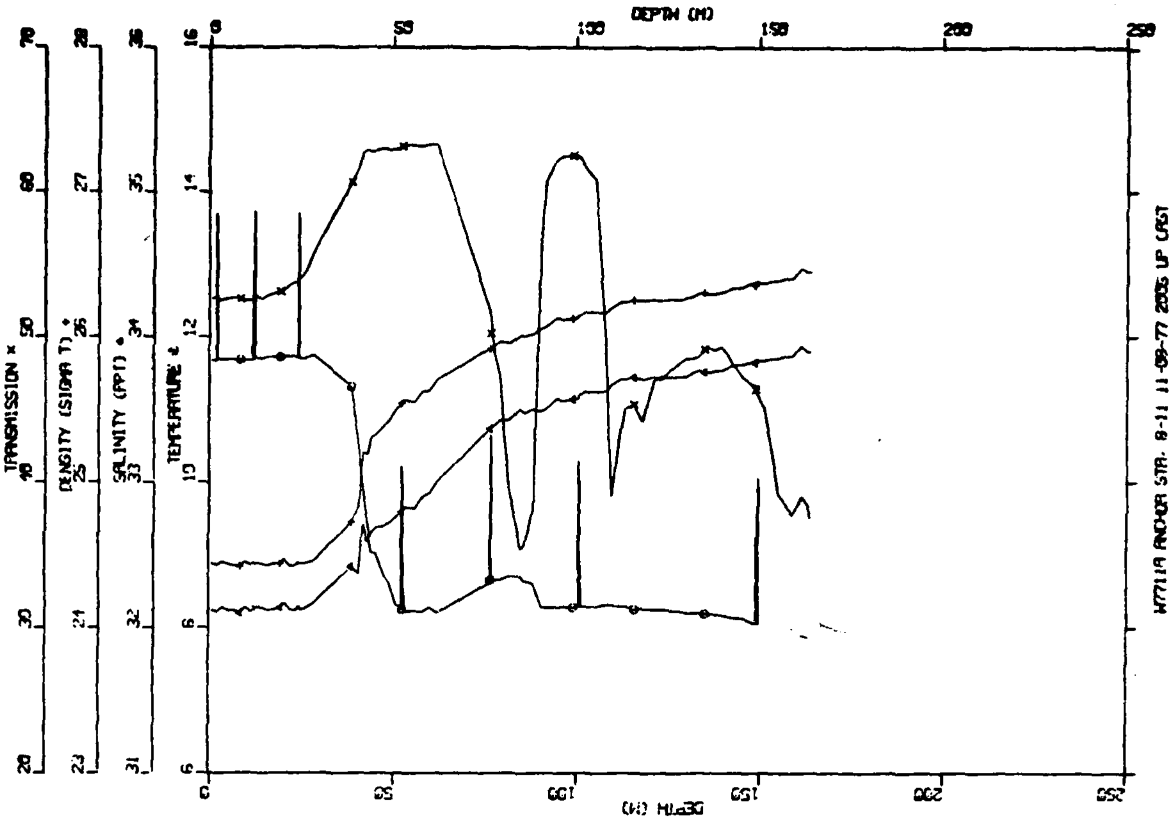
W7719 ANCHOR STA. 8-10 11-08-77 1808 UP CAST
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●

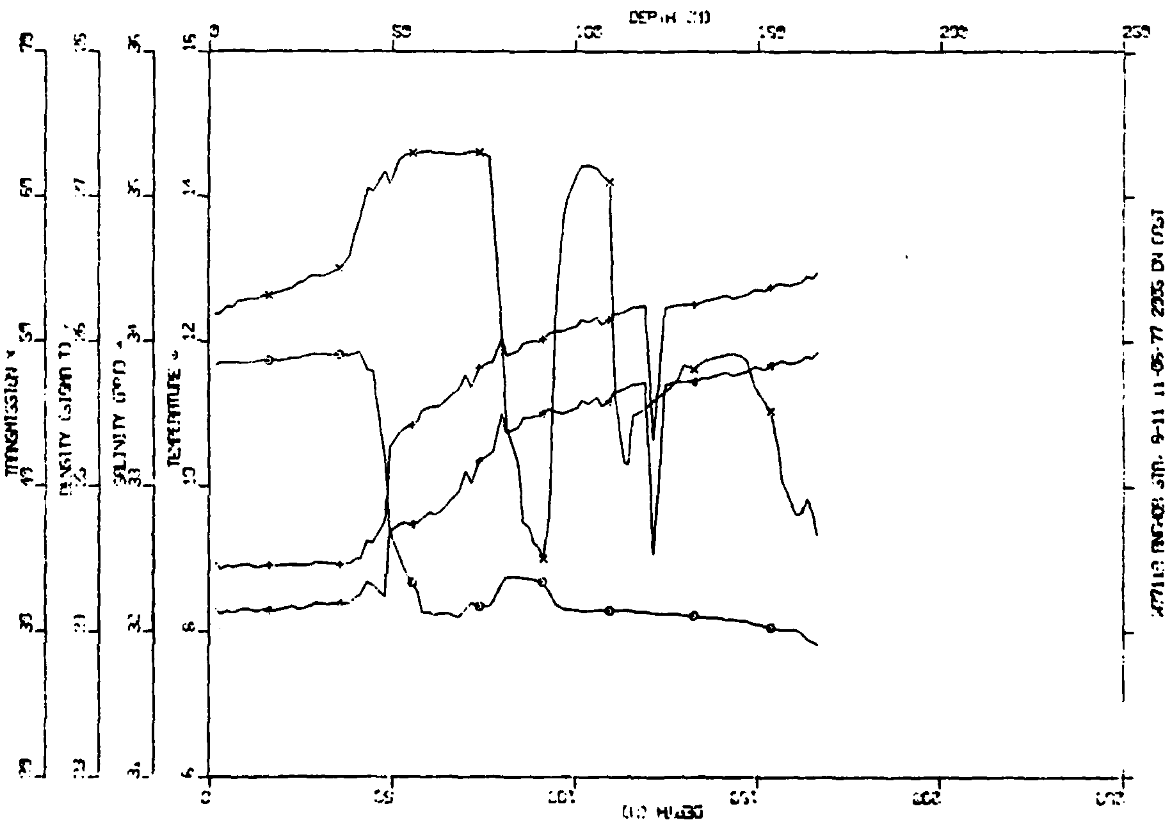


W7719 ANCHOR STA. 8-10 11-08-77 1808 DN CAST
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●

W7711A STA 8-11 11-08-77 2005 DN CAST

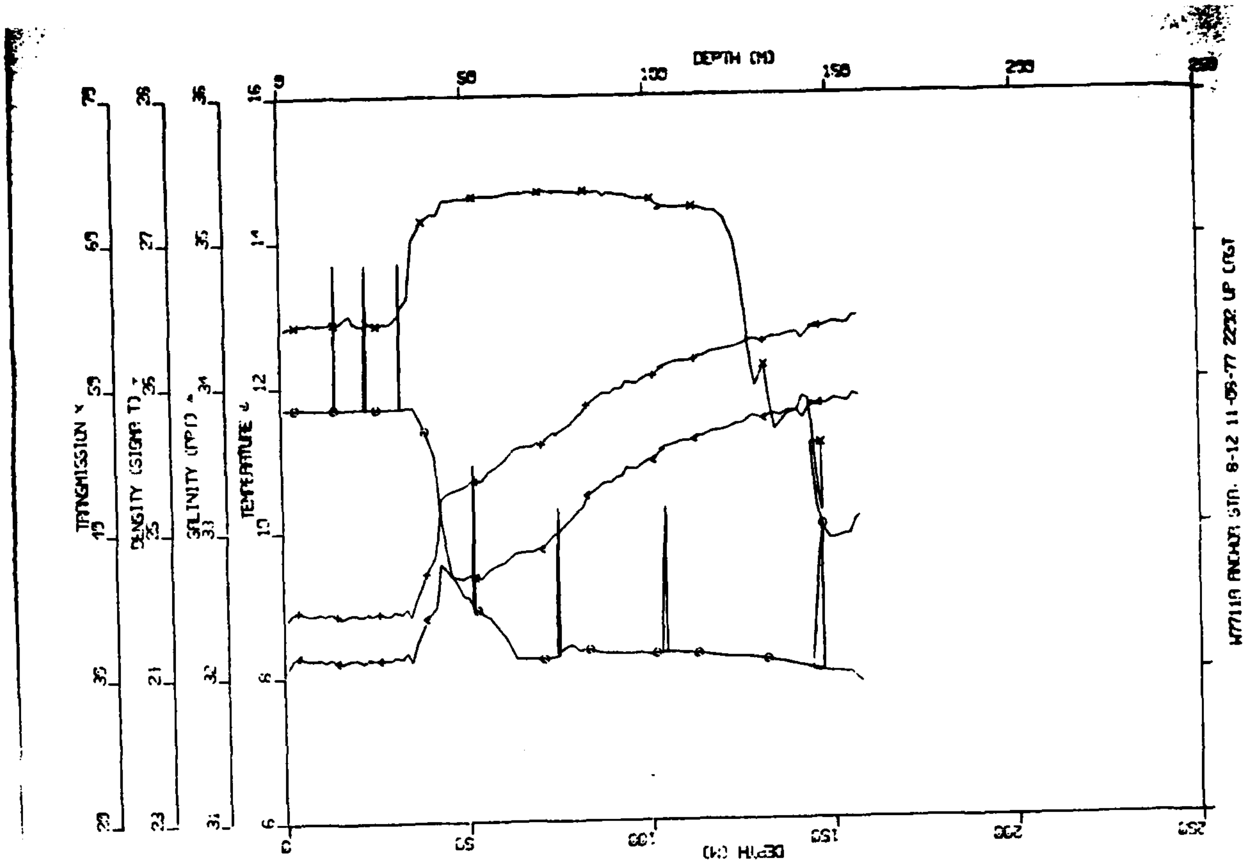
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.71	32.13	24.44	52.31
10.0	11.72	32.15	24.46	52.88
15.0	11.74	32.15	24.45	53.15
20.0	11.75	32.16	24.46	53.45
25.0	11.79	32.16	24.45	54.05
30.0	11.82	32.19	24.47	54.54
35.0	11.82	32.20	24.47	55.14
40.0	11.83	32.23	24.49	57.52
45.0	11.20	32.32	24.67	60.84
50.0	9.42	32.63	25.22	61.75
60.0	8.26	32.81	25.54	63.11
70.0	8.32	33.06	25.73	63.06
80.0	8.64	33.41	25.95	50.38
90.0	8.71	33.50	26.01	35.72
100.0	8.30	33.55	26.11	61.07
110.0	8.30	33.62	26.17	54.19
120.0	8.28	33.31	25.93	45.63
130.0	8.24	33.73	26.26	48.11
140.0	8.20	33.78	26.31	49.05
150.0	8.10	33.82	26.35	46.72
160.0	8.02	33.86	26.40	38.72
166.3	7.84	33.92	26.47	37.09

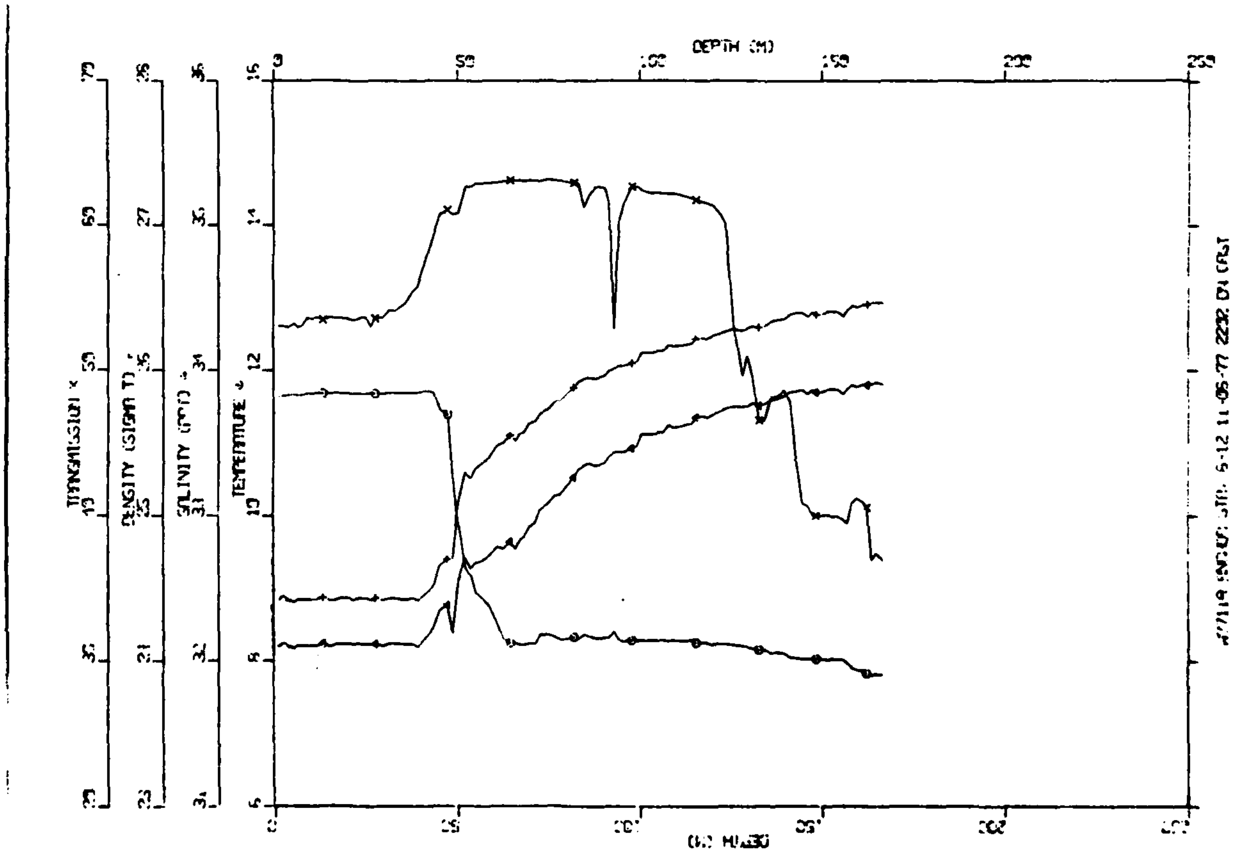

DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


TRANSMISSION
SALINITY (PPT)
TEMPERATURE

W7711A STA 8-12 11-08-77 2202 DN CAST

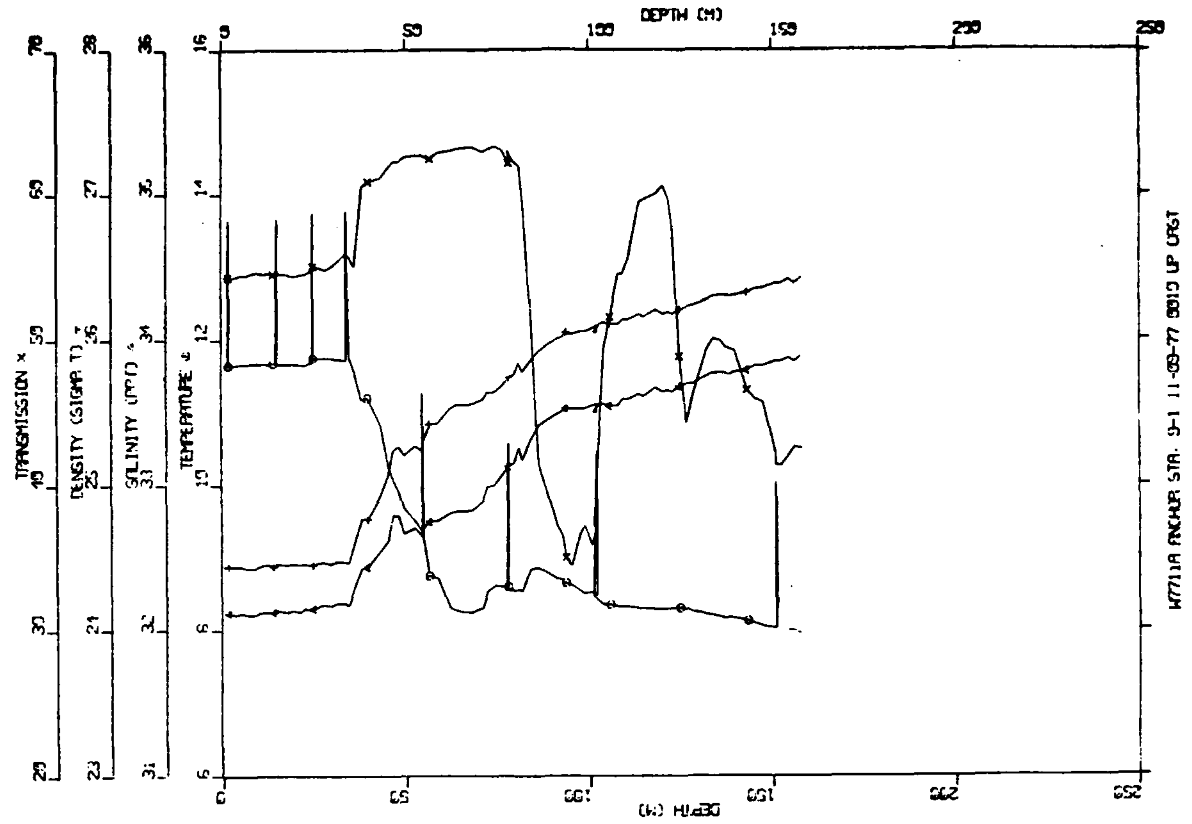
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.68	32.10	24.42	53.16
10.0	11.69	32.11	24.43	53.61
15.0	11.69	32.11	24.43	53.64
20.0	11.69	32.12	24.44	53.60
25.0	11.69	32.12	24.44	53.53
30.0	11.69	32.12	24.44	53.88
35.0	11.71	32.12	24.44	54.67
40.0	11.72	32.14	24.45	56.84
45.0	11.53	32.32	24.63	60.34
50.0	9.98	32.49	25.02	61.29
60.0	8.62	32.76	25.45	63.01
70.0	8.26	32.93	25.64	63.16
80.0	8.33	33.21	25.85	63.10
90.0	8.33	33.38	25.97	62.39
100.0	8.29	33.54	26.11	62.53
110.0	8.29	33.62	26.18	62.16
120.0	8.24	33.70	26.24	61.26
130.0	8.18	33.77	26.30	49.82
140.0	8.09	33.84	26.38	48.06
150.0	8.03	33.86	26.40	40.05
160.0	7.88	33.90	26.45	41.04
166.7	7.82	33.91	26.47	37.10

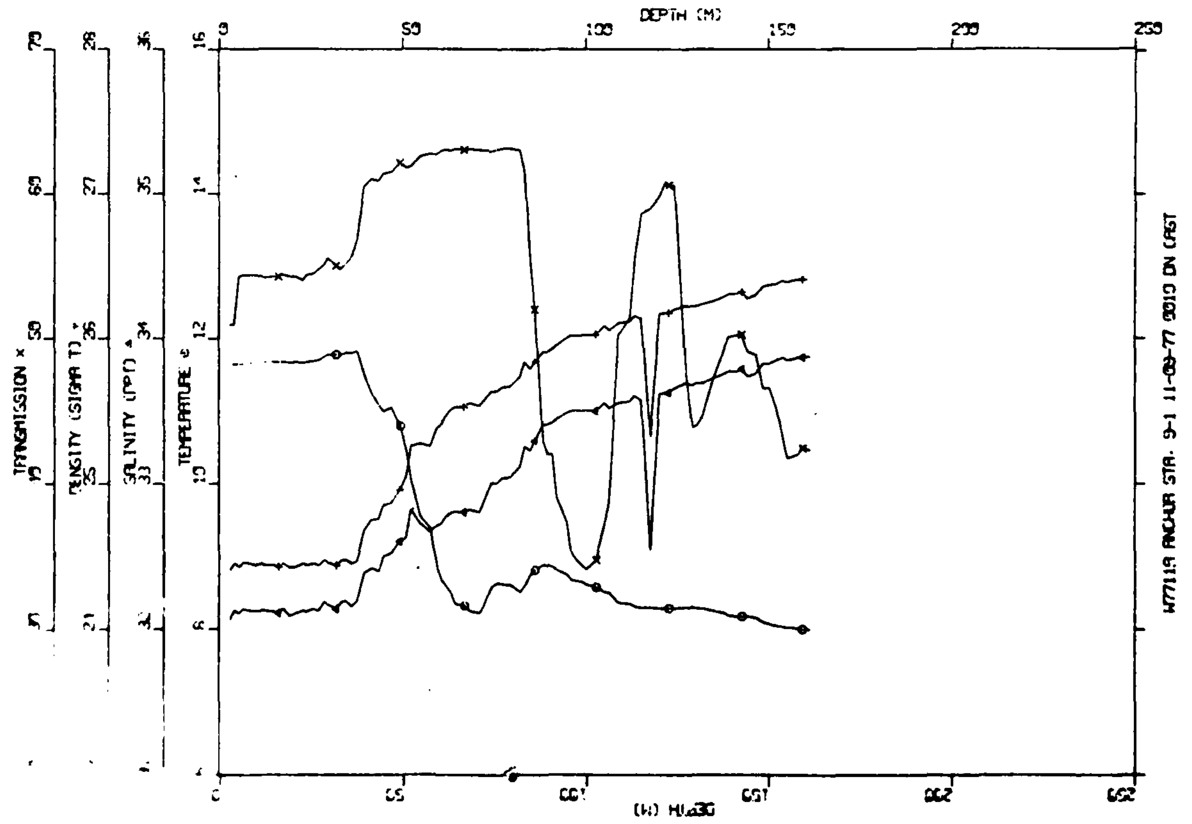

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W7711A ANCHOR STN. 8-12 11-05-77 2232 UP CAST


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C

W7711A STA 9-1 11-09-77 0010 DN CAST

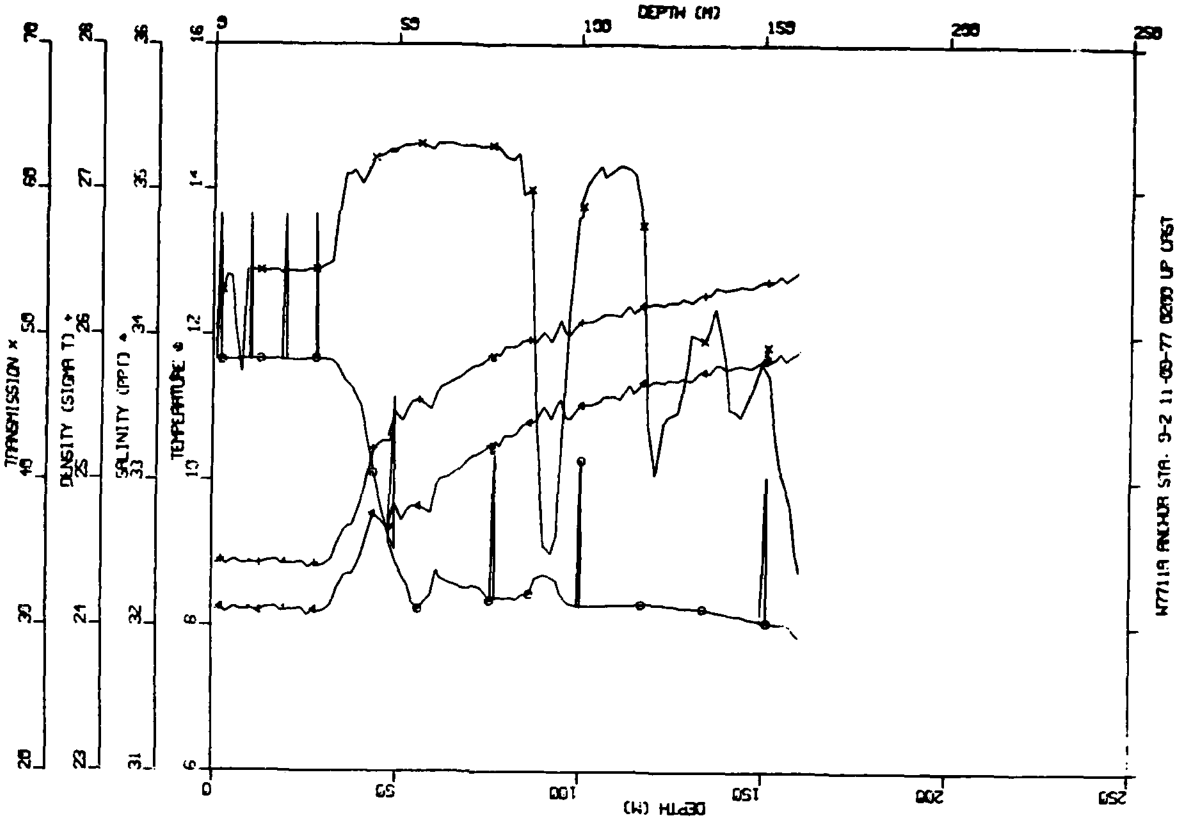
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.66	32.12	24.44	53.27
10.0	11.68	32.13	24.45	54.37
15.0	11.68	32.12	24.44	54.27
20.0	11.68	32.11	24.43	54.24
25.0	11.69	32.13	24.45	54.50
30.0	11.77	32.17	24.46	55.26
35.0	11.81	32.19	24.47	55.45
40.0	11.43	32.37	24.68	60.16
45.0	11.04	32.49	24.84	61.36
50.0	10.61	32.63	25.02	61.90
60.0	8.77	32.72	25.40	62.89
70.0	8.31	32.86	25.56	63.05
80.0	8.59	33.09	25.71	63.01
90.0	8.87	33.42	25.93	41.77
100.0	8.62	33.51	26.03	34.38
110.0	8.38	33.56	26.11	49.21
120.0	8.30	33.34	25.94	59.79
130.0	8.29	33.70	26.23	44.38
140.0	8.19	33.78	26.31	50.06
150.0	8.08	33.84	26.37	46.32
160.0	8.01	33.87	26.41	42.34
159.4	8.00	33.88	26.41	42.38

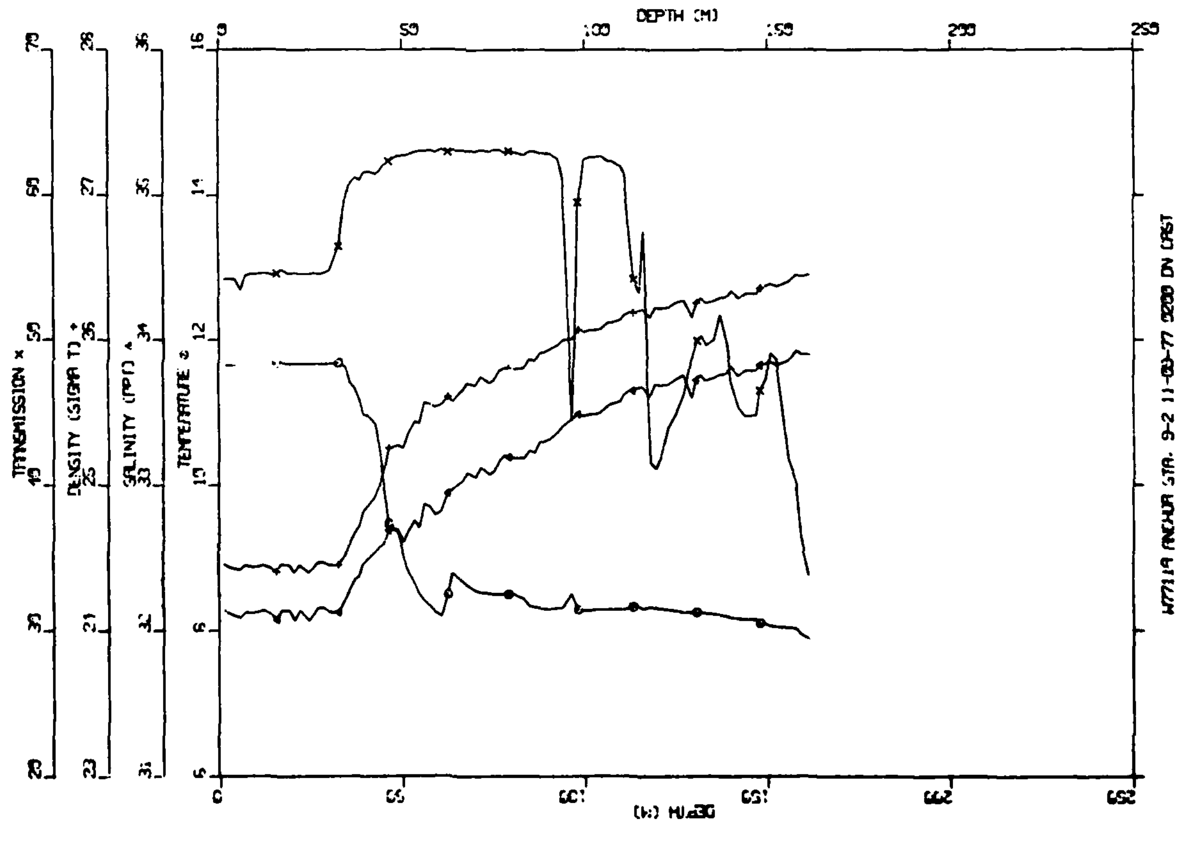

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o
W7711A ANCHOR STA. 9-1 11-09-77 0010 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o
W7711A ANCHOR STA. 9-1 11-09-77 0010 DN CAST

W77[illegible]1A STA 9-2 11-09-77 0200 DN CAST

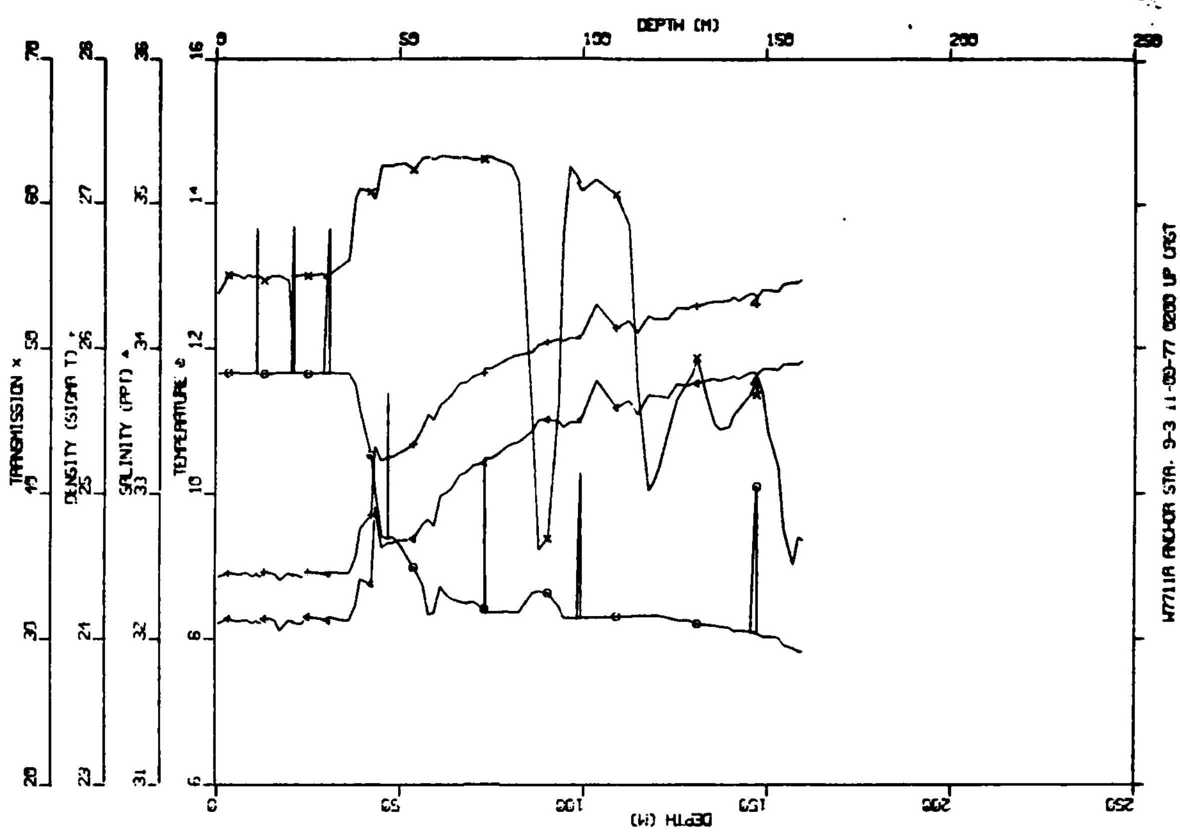
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.67	32.10	24.43	53.32
10.0	11.68	32.13	24.44	54.60
15.0	11.69	32.11	24.43	54.60
20.0	11.68	32.11	24.43	54.65
25.0	11.68	32.11	24.43	54.63
30.0	11.68	32.14	24.46	55.20
35.0	11.56	32.24	24.55	59.73
40.0	10.98	32.48	24.84	61.51
45.0	10.01	32.62	25.11	62.03
50.0	9.12	32.65	25.29	62.71
60.0	8.28	32.84	25.56	63.05
70.0	8.57	33.09	25.71	63.07
80.0	8.50	33.19	25.81	62.97
90.0	8.32	33.33	25.94	62.82
100.0	8.28	33.49	26.07	61.91
110.0	8.29	33.60	26.15	61.68
120.0	8.32	33.69	26.22	41.82
130.0	8.26	33.69	26.23	49.16
140.0	8.18	33.79	26.32	47.39
150.0	8.08	33.84	26.38	48.04
160.0	7.94	33.91	26.45	35.89
159.1	7.91	33.90	26.45	34.50

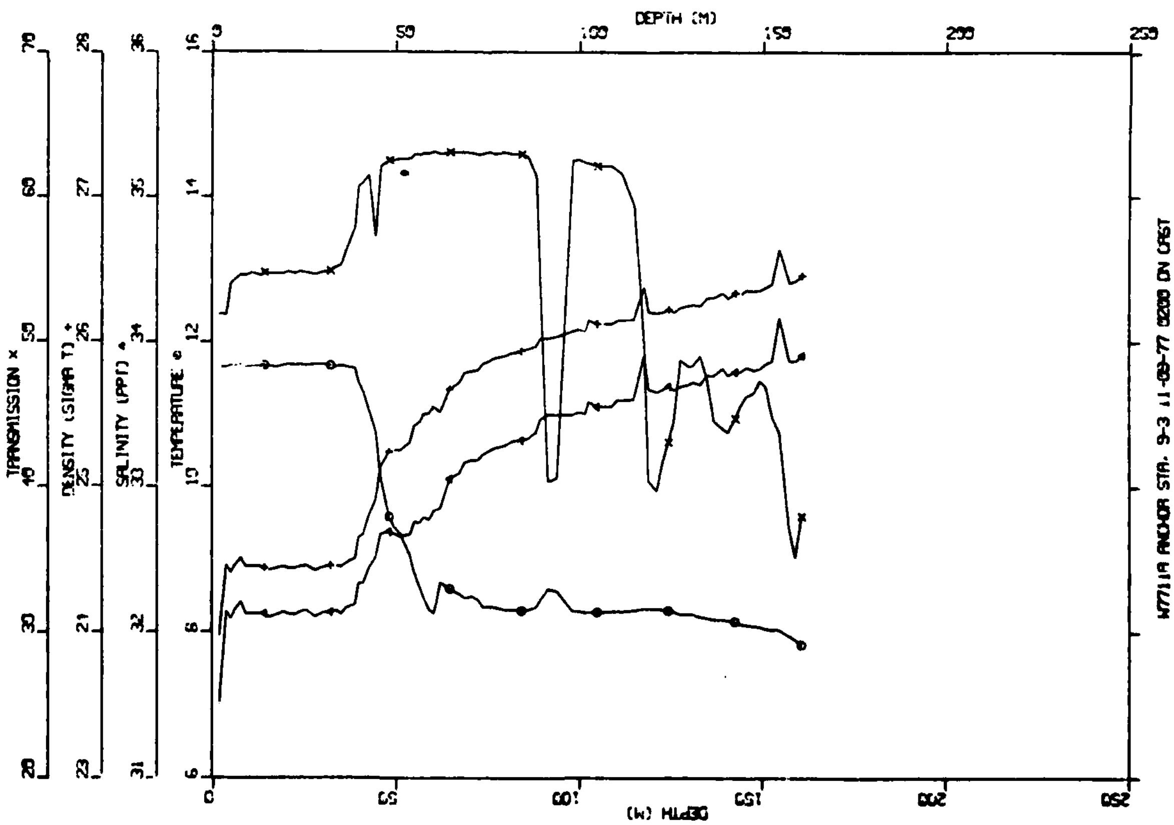

W7711A ANCHOR STA. 9-2 11-03-77 0200 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙


W7711A ANCHOR STA. 9-2 11-03-77 0200 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙

W7711A STA 9-3 11-09-77 0400 DN CAST

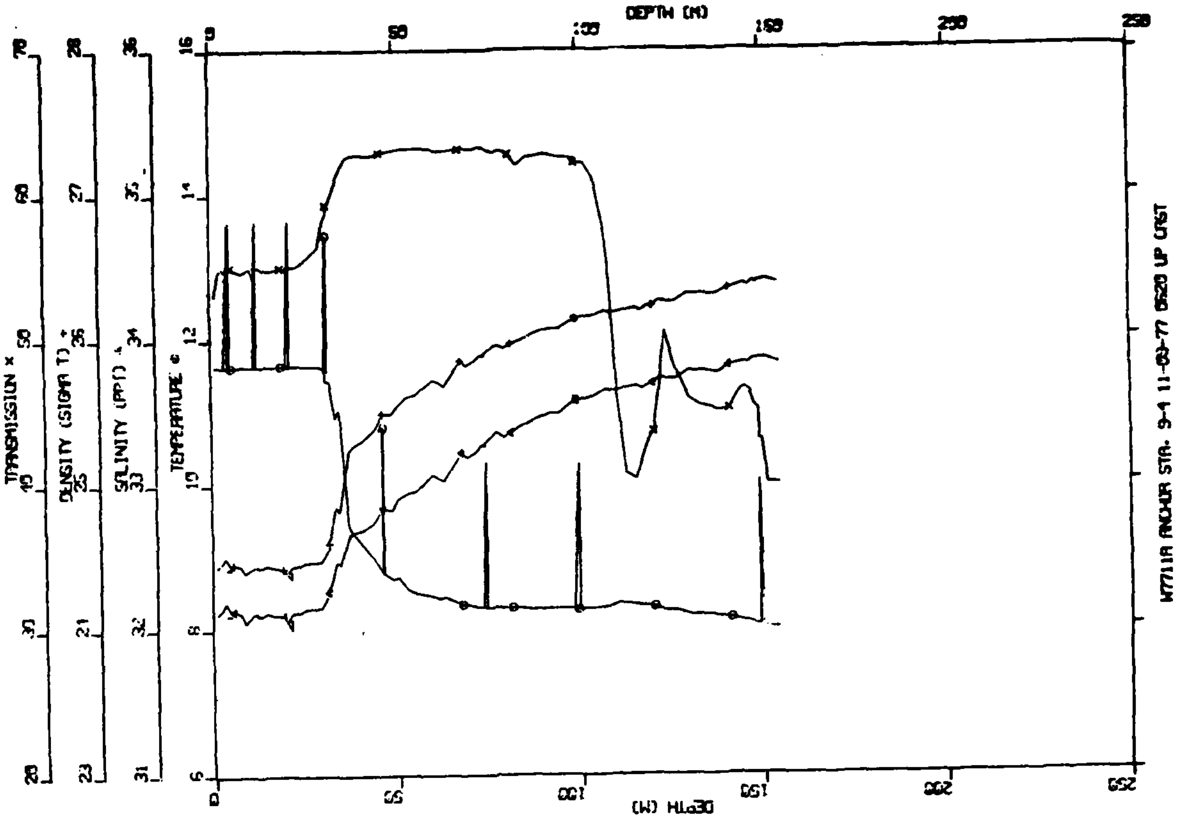
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.67	32.12	24.44	53.66
10.0	11.67	32.14	24.46	54.70
15.0	11.67	32.11	24.44	54.74
20.0	11.69	32.13	24.45	54.76
25.0	11.69	32.14	24.45	54.77
30.0	11.69	32.13	24.45	54.80
35.0	11.68	32.15	24.46	55.52
40.0	11.46	32.31	24.63	60.19
45.0	10.51	32.57	25.00	60.06
50.0	9.41	32.68	25.26	62.58
60.0	8.38	32.82	25.54	63.06
70.0	8.49	33.18	25.79	63.07
80.0	8.33	33.30	25.92	63.03
90.0	8.49	33.47	26.02	49.05
100.0	8.29	33.51	26.09	62.53
110.0	8.29	33.59	26.15	61.91
120.0	8.33	33.70	26.23	41.57
130.0	8.26	33.71	26.25	48.48
140.0	8.18	33.80	26.32	44.15
150.0	8.07	33.84	26.37	46.84
160.0	7.88	33.89	26.44	36.80
159.3	7.85	33.90	26.45	37.31

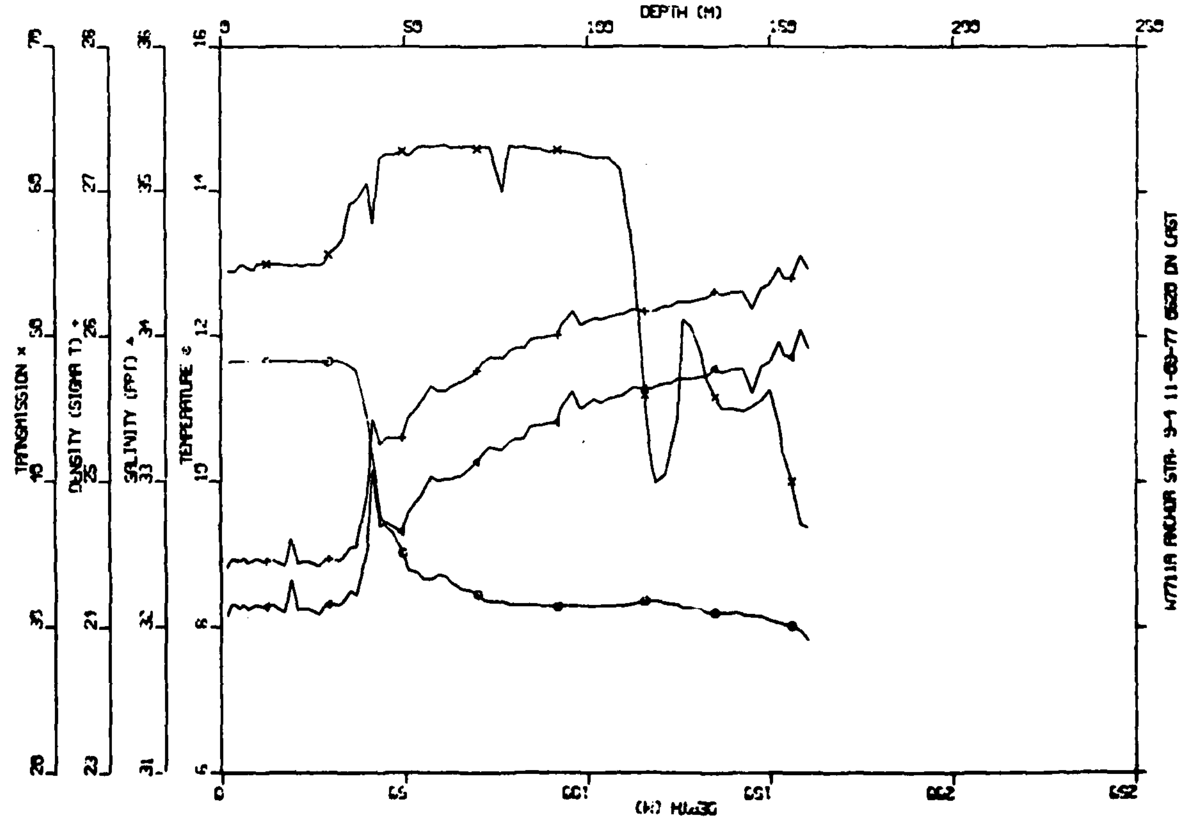

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙
W7711A ANCHOR STA. 9-3 11-09-77 0200 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙
W7711A ANCHOR STA. 9-3 11-09-77 0200 DN CAST

W77[illegible]1A STA 9-4 11-09-77 0621 DN CAST

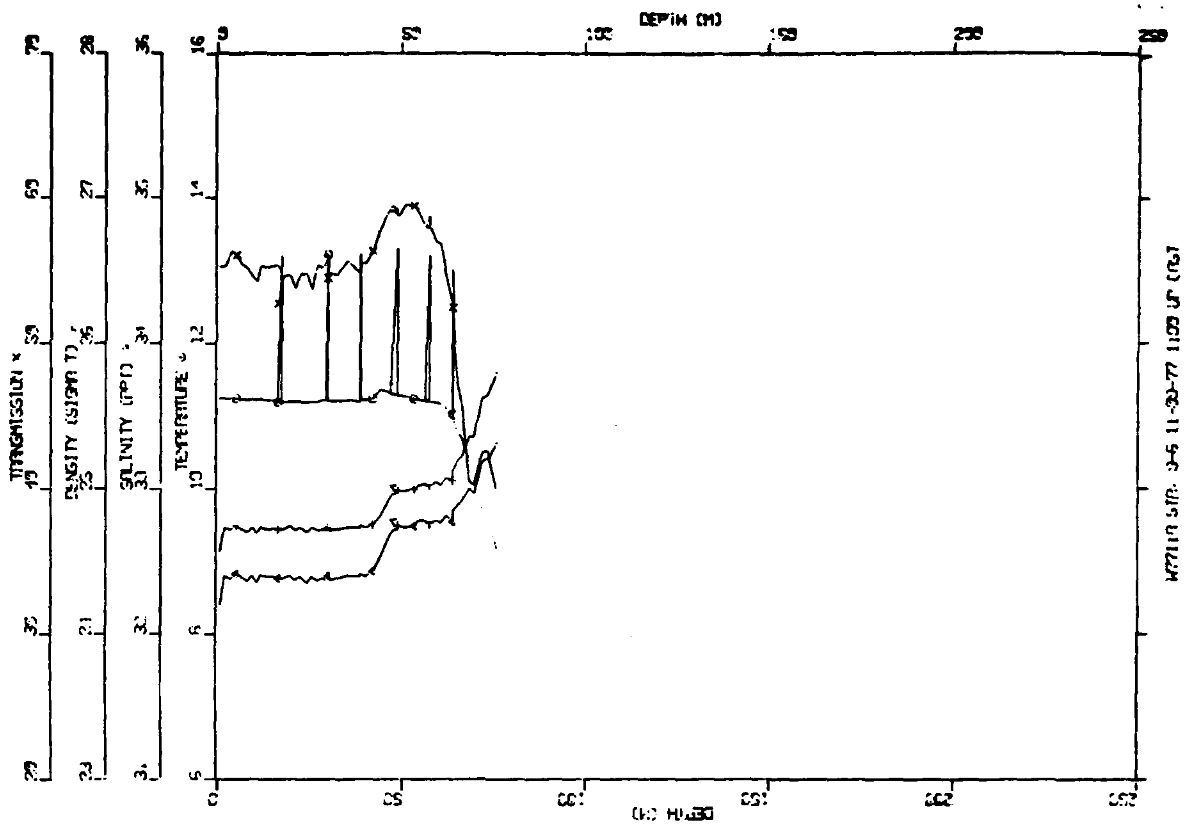
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.66	32.14	24.46	54.76
10.0	11.66	32.15	24.46	54.89
15.0	11.66	32.13	24.44	54.94
20.0	11.66	32.19	24.49	54.89
25.0	11.67	32.12	24.44	54.94
30.0	11.66	32.15	24.47	55.85
35.0	11.59	32.22	24.53	58.58
40.0	10.72	32.66	25.04	59.58
45.0	9.40	32.71	25.29	62.53
50.0	8.94	32.74	25.38	62.67
60.0	8.70	33.02	25.64	63.15
70.0	8.43	33.75	26.25	63.04
80.0	8.31	33.29	25.92	62.96
90.0	8.29	33.41	26.01	62.81
100.0	8.29	33.54	26.11	62.45
110.0	8.31	33.61	26.17	58.85
120.0	8.34	33.67	26.20	40.54
130.0	8.26	33.72	26.26	49.35
140.0	8.19	33.77	26.30	44.98
150.0	8.09	33.85	26.38	45.44
160.0	7.88	33.96	26.49	37.14
158.5	7.86	33.95	26.49	36.96

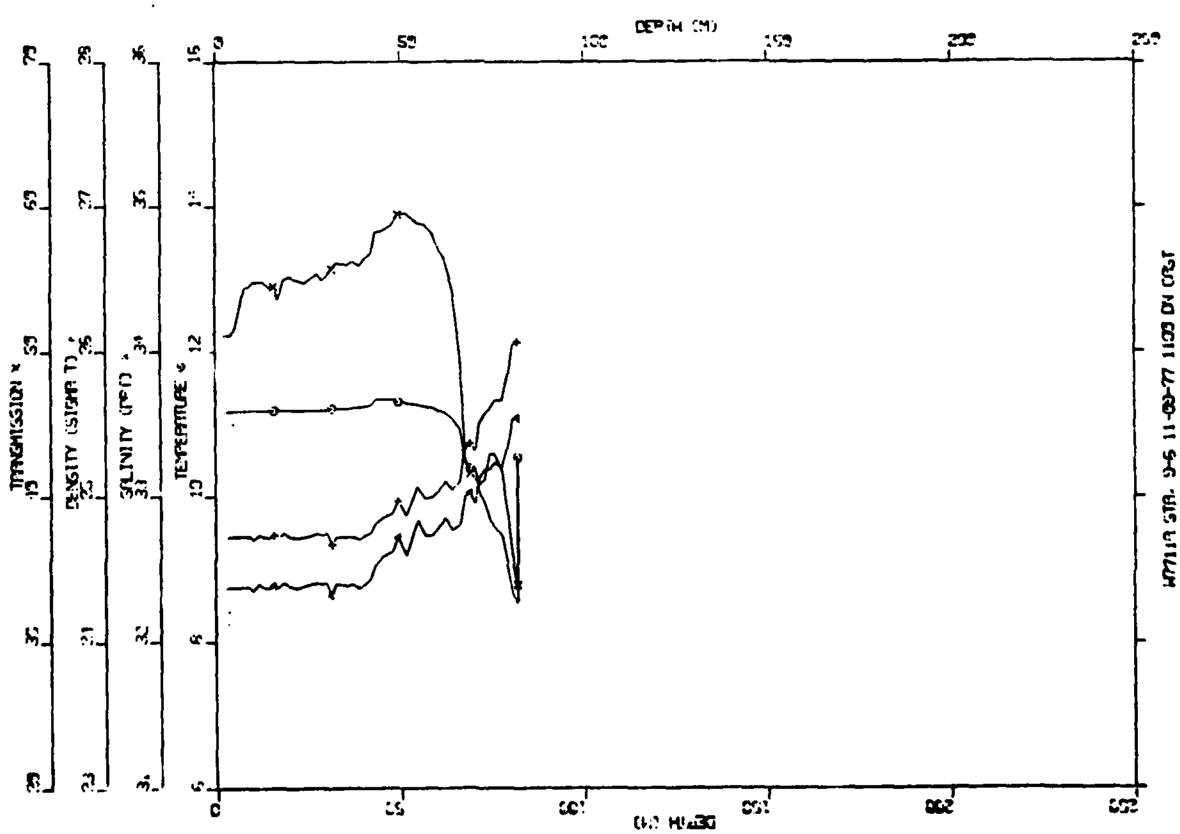

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) Δ
TEMPERATURE ◦
W7711A ANCHOR STA. 9-4 11-03-77 0520 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) Δ
TEMPERATURE ◦
W7711A ANCHOR STA. 9-4 11-03-77 0520 DN CAST

W7711A STA 9-6 11-09-77 1100 DN CAST

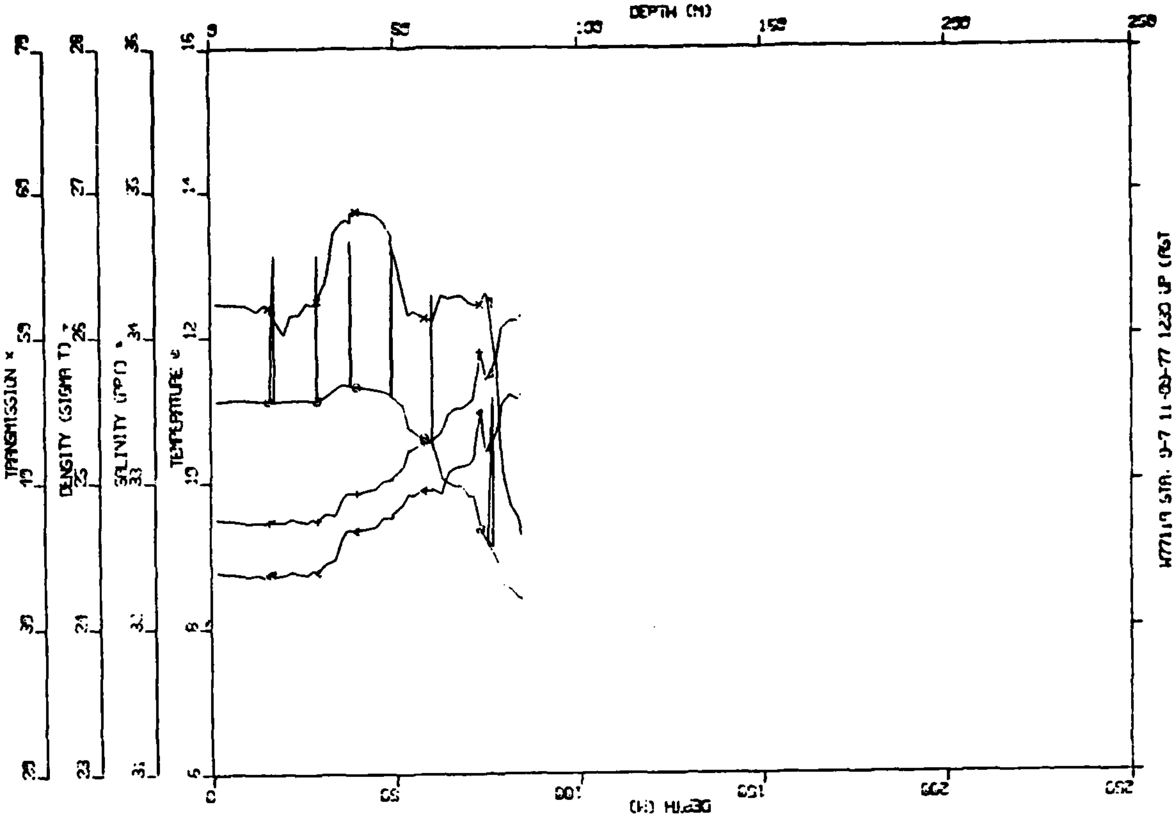
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.19	32.38	24.73	52.11
10.0	11.21	32.38	24.72	54.75
15.0	11.21	32.38	24.73	54.39
20.0	11.21	32.39	24.73	55.04
25.0	11.21	32.40	24.74	55.03
30.0	11.22	32.39	24.73	55.35
35.0	11.23	32.40	24.73	56.11
40.0	11.26	32.40	24.74	56.37
45.0	11.36	32.59	24.86	58.46
50.0	11.32	32.68	24.94	59.31
60.0	11.21	32.79	25.04	57.31
70.0	10.34	33.02	25.37	41.37
80.0	8.91	33.43	25.93	37.44
82.0	9.06	33.55	26.07	33.96

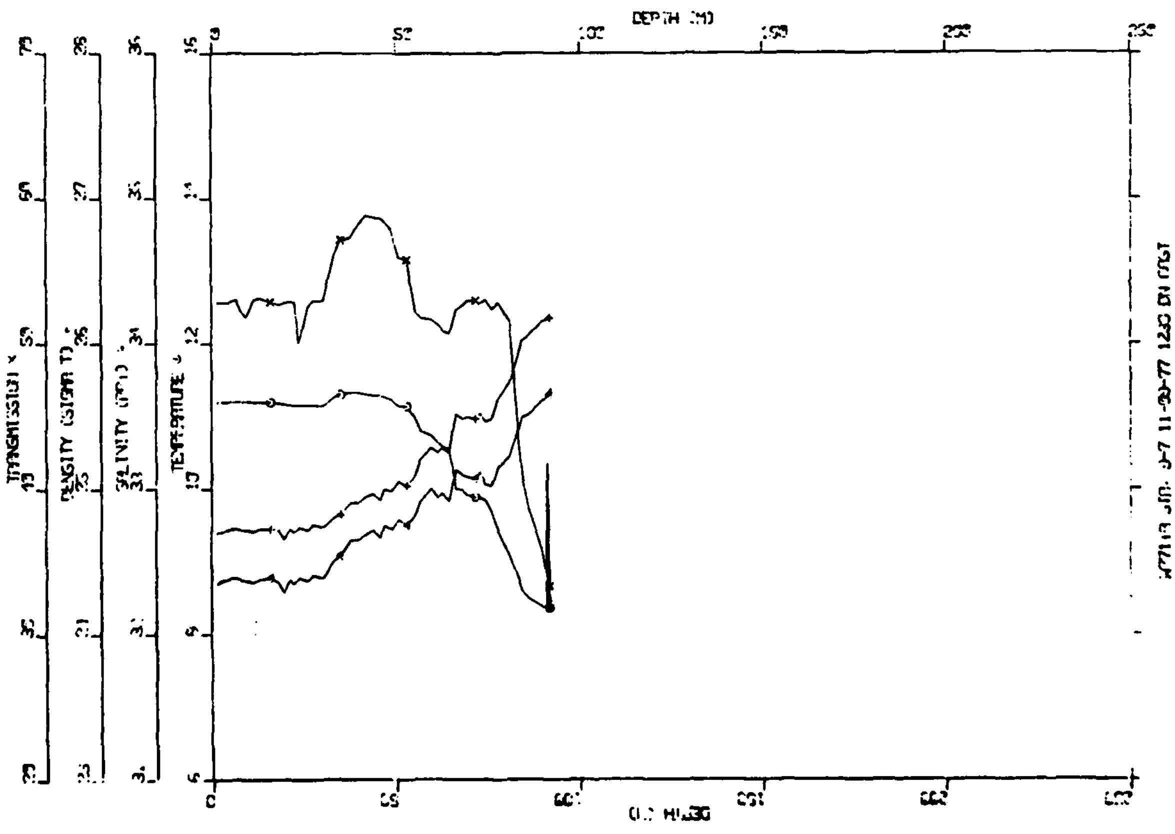

DEPTH (M)
TRANSMISSION %
TEMPERATURE C


DEPTH (M)
TRANSMISSION %
TEMPERATURE C

W7711A STA 9-7 11-07-77 1230 DN CAST

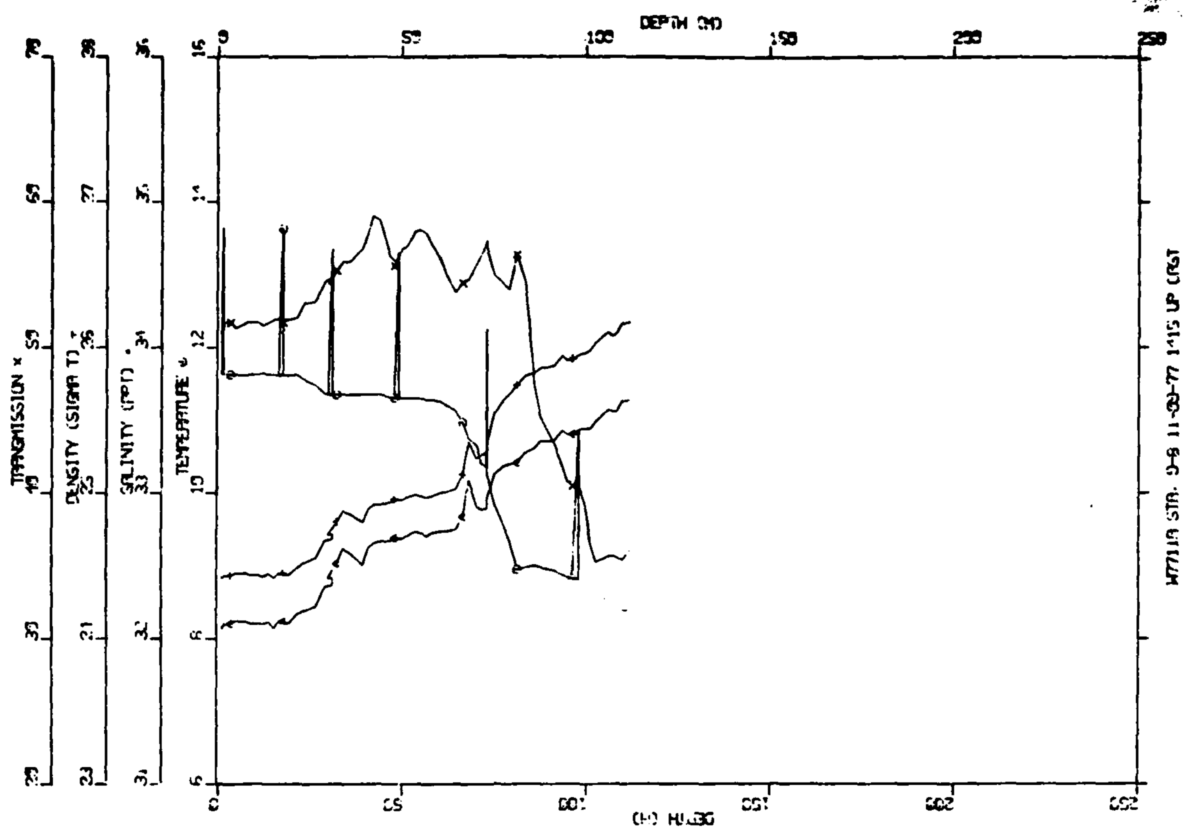
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.20	32.39	24.73	52.81
10.0	11.22	32.37	24.72	52.47
15.0	11.20	32.38	24.73	52.95
20.0	11.18	32.34	24.70	52.86
25.0	11.17	32.39	24.74	51.80
30.0	11.19	32.43	24.76	53.72
35.0	11.31	32.56	24.85	56.97
40.0	11.34	32.67	24.93	58.24
45.0	11.30	32.70	24.96	58.64
50.0	11.19	32.76	25.03	56.74
60.0	10.73	32.97	25.27	51.60
70.0	9.93	33.09	25.50	52.97
80.0	9.20	33.22	25.72	50.73
90.0	8.52	33.61	26.15	35.56
92.2	8.36	33.69	26.21	32.52

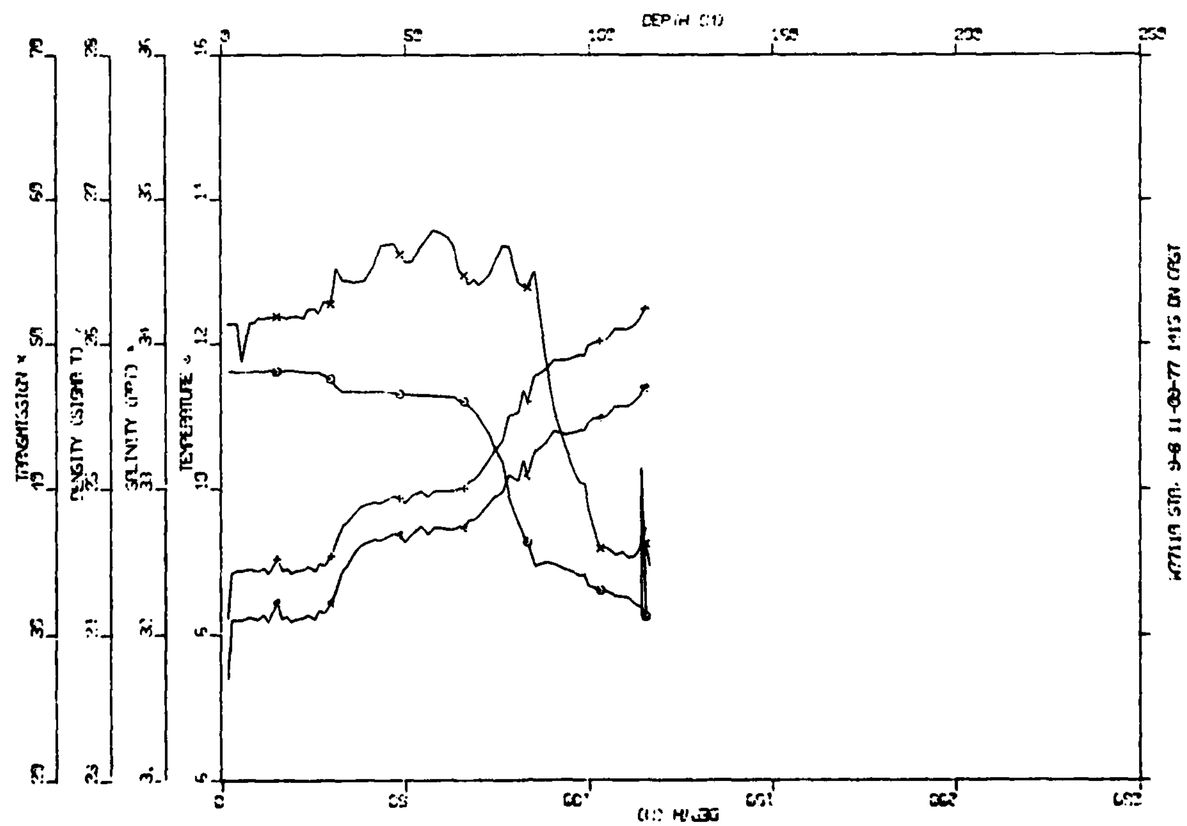

DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 9-8 11-09-7701415 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.62	32.11	24.44	49.95
10.0	11.63	32.12	24.45	51.73
15.0	11.63	32.16	24.48	51.89
20.0	11.63	32.11	24.44	51.88
25.0	11.62	32.13	24.46	52.35
30.0	11.50	32.25	24.57	53.66
35.0	11.36	32.52	24.81	54.33
40.0	11.34	32.64	24.90	55.08
45.0	11.34	32.68	24.93	56.63
50.0	11.32	32.67	24.93	55.85
60.0	11.29	32.74	24.99	57.63
70.0	10.96	32.85	25.13	54.41
80.0	9.66	33.10	25.54	55.08
90.0	8.97	33.37	25.87	46.22
100.0	8.70	33.46	25.99	38.52
110.0	8.51	33.58	26.11	35.51
116.5	8.24	33.71	26.25	35.16


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) •
TEMPERATURE ◇

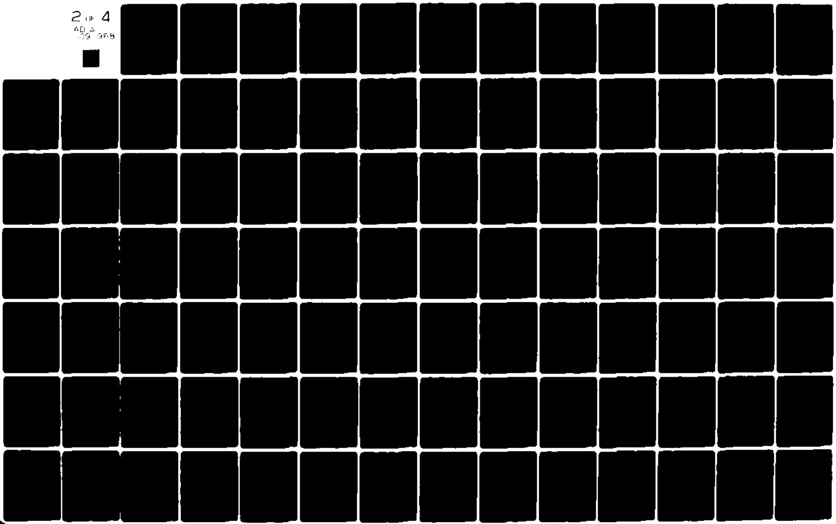

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) •
TEMPERATURE ◇

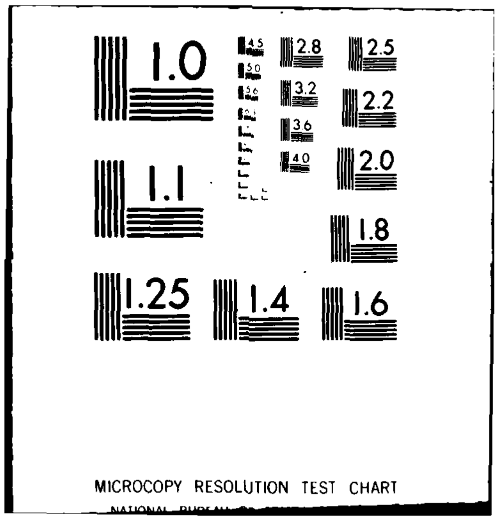
W7711A STA 9-9 11-09-77 1600 DN CAST

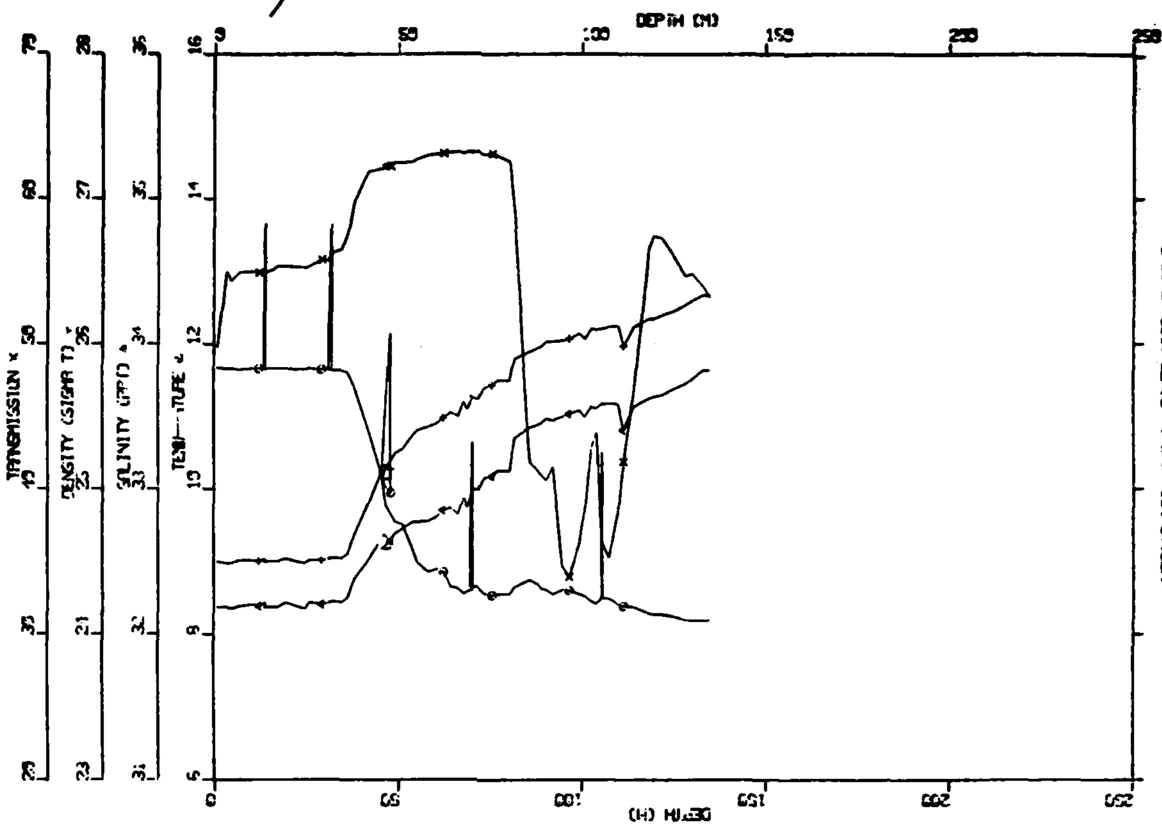
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.68	32.21	24.50	51.27
10.0	11.67	32.20	24.50	54.86
15.0	11.68	32.19	24.49	54.93
20.0	11.68	32.20	24.50	54.91
25.0	11.68	32.20	24.50	54.88
30.0	11.67	32.15	24.46	54.82
35.0	11.68	32.21	24.51	55.24
40.0	11.59	32.26	24.56	56.97
45.0	11.10	32.37	24.74	60.44
50.0	9.94	32.53	25.06	61.90
60.0	8.85	32.76	25.41	62.82
70.0	8.57	32.86	25.53	62.89
80.0	8.57	33.12	25.74	62.89
90.0	8.66	33.42	25.96	46.20
100.0	8.58	33.48	26.01	36.63
110.0	8.51	33.58	26.10	35.31
120.0	8.35	33.60	26.15	48.90
130.0	8.26	33.71	26.25	56.48
140.0	8.20	33.76	26.29	53.84
150.0	8.18	33.82	26.37	34.49
160.0	9.07	35.56	27.55	39.43
170.0	10.09	36.32	28.03	42.59
140.6	9.40	34.75	26.95	51.28

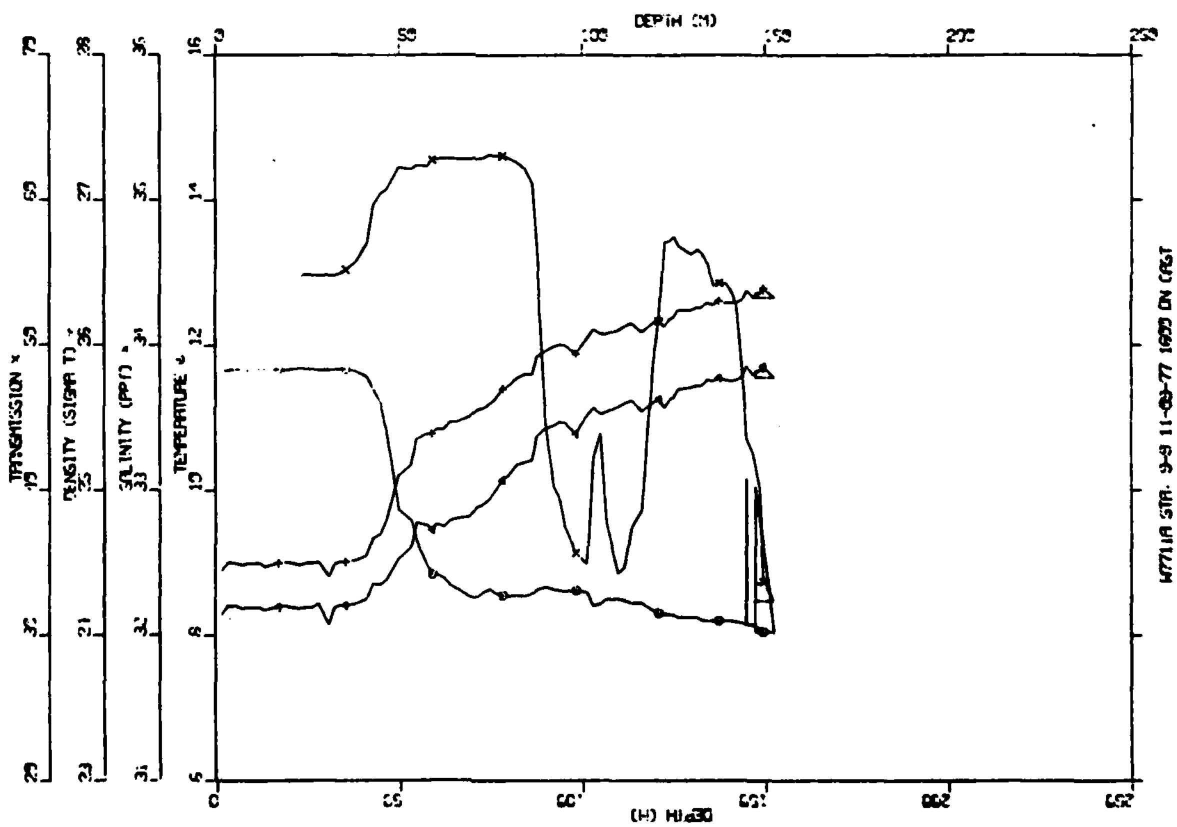
AD-A092 988 OREGON STATE UNIV CORVALLIS SCHOOL OF OCEANOGRAPHY F/G 8/10
HYDROGRAPHIC, OPTICAL, AND BIOLOGICAL OBSERVATIONS ON THE CENTR--ETC(U)
APR 80 D W MENZIES, J C KITCHEN, S MOORE N00014-76-C-0067
UNCLASSIFIED DATA-81 NL

2 OF 4
AD A
092 988



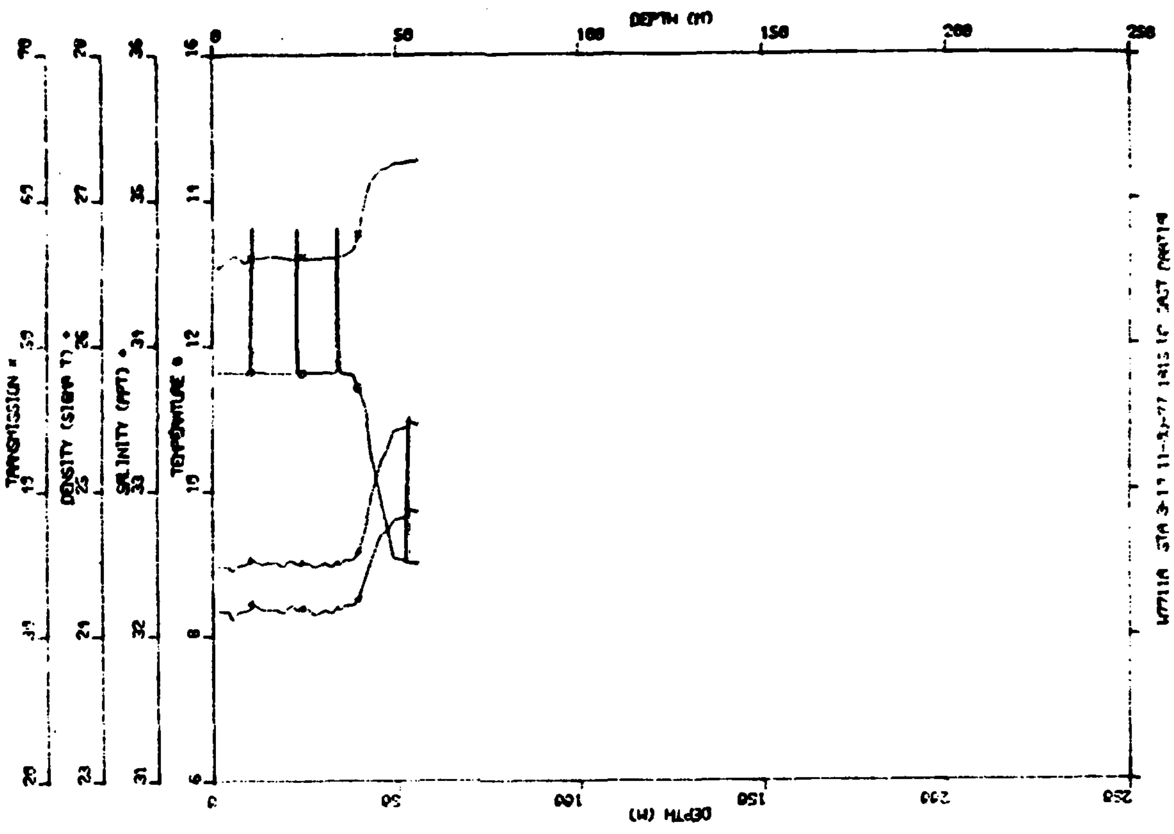

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
MICROCOPY RESOLUTION TEST CHART

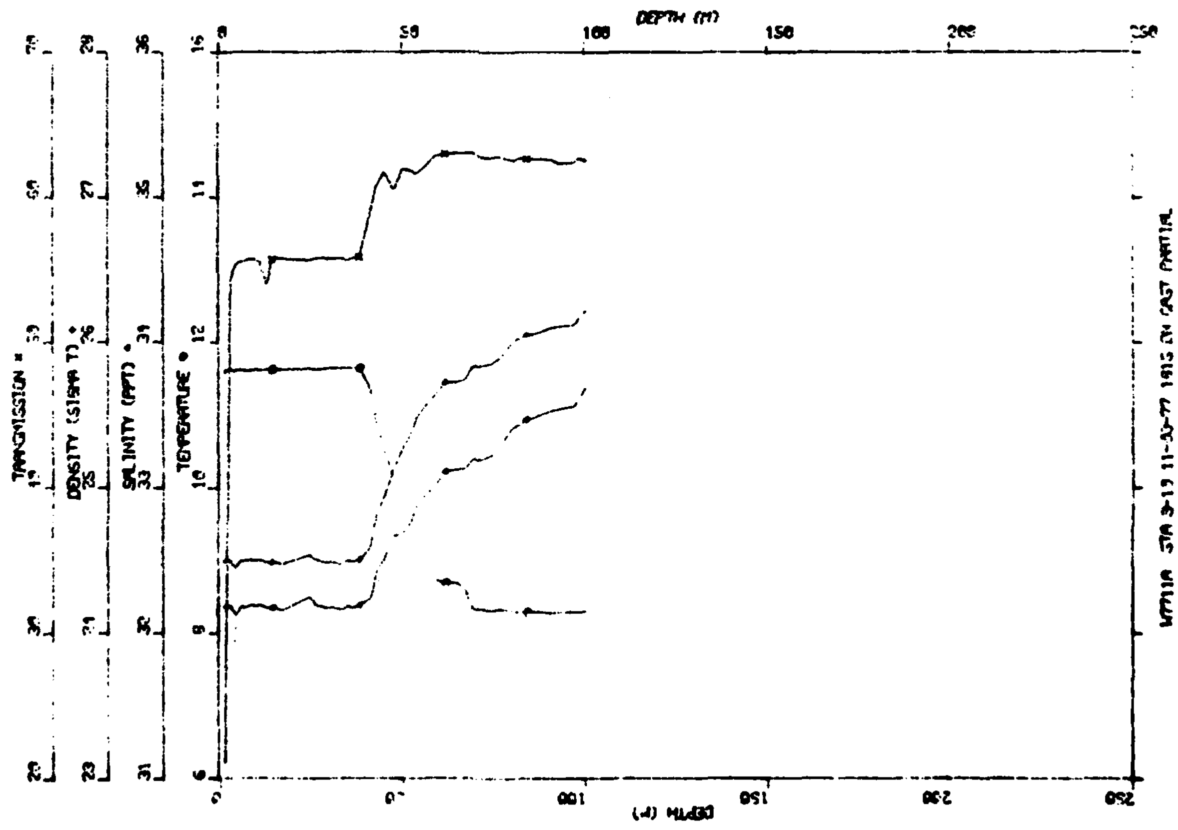

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T)
SALINITY (PPT)
W7711A STA. 9-9 11-09-77 1600 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
W7711A STA. 9-9 11-09-77 1600 DN CAST

W7711A STA 9-10 11-09-77 1815 DN CAST

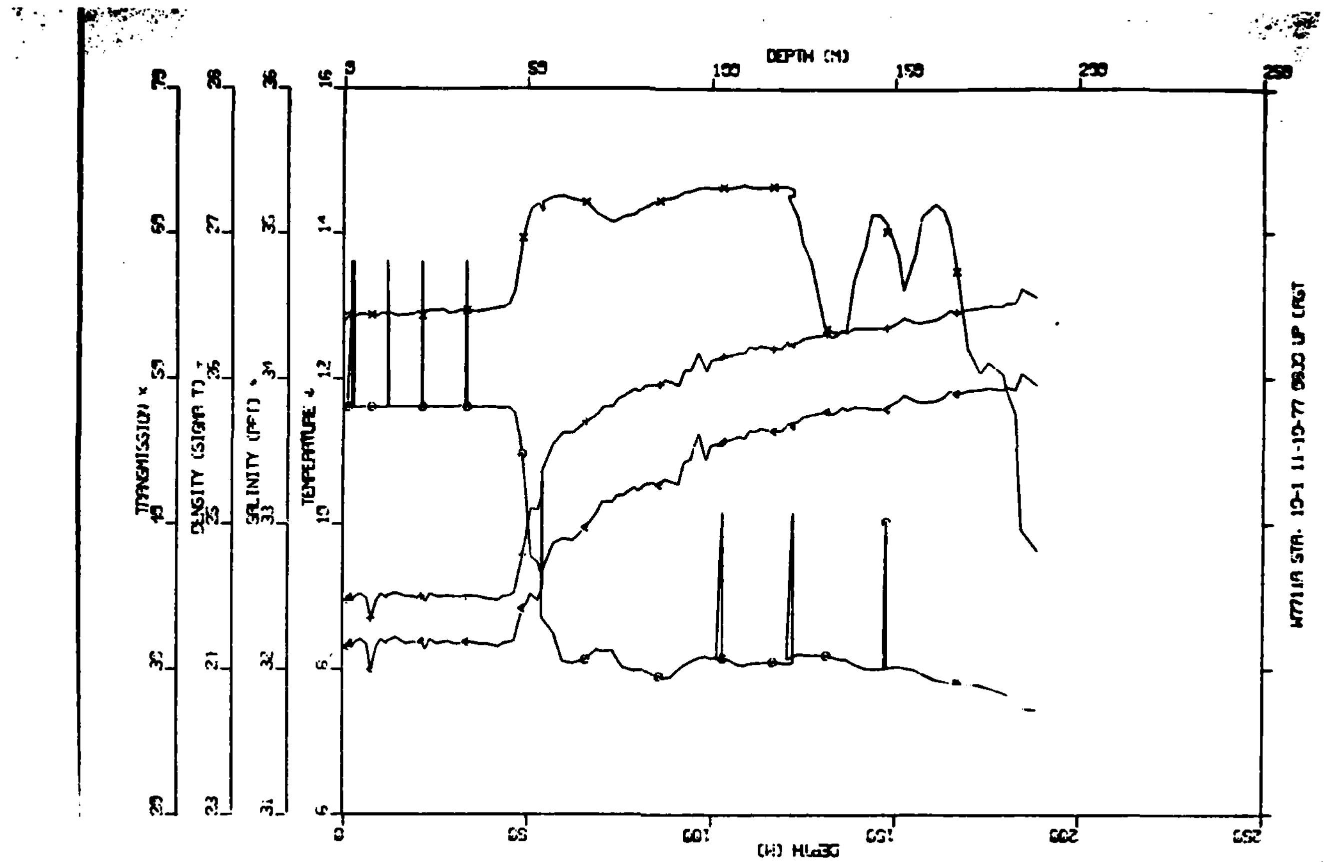
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.63	32.16	24.48	55.27
10.0	11.63	32.20	24.51	55.68
15.0	11.63	32.18	24.49	55.43
20.0	11.63	32.20	24.51	55.73
25.0	11.64	32.21	24.51	55.76
30.0	11.64	32.18	24.49	55.78
35.0	11.64	32.18	24.49	55.69
40.0	11.44	32.24	24.58	57.73
45.0	10.55	32.52	24.96	61.14
50.0	9.50	32.70	25.26	61.56
60.0	8.73	33.04	25.66	62.74
70.0	8.37	33.19	25.82	62.96
80.0	8.32	33.38	25.97	62.66
90.0	8.29	33.52	26.09	62.61
100.0	8.34	33.61	26.16	62.86
110.0	8.96	34.42	26.69	64.78
120.0	9.93	35.37	27.36	67.21
130.0	9.70	35.10	27.20	61.25
140.0	11.79	34.49	26.31	60.70
72.6	8.80	33.30	25.91	62.91


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

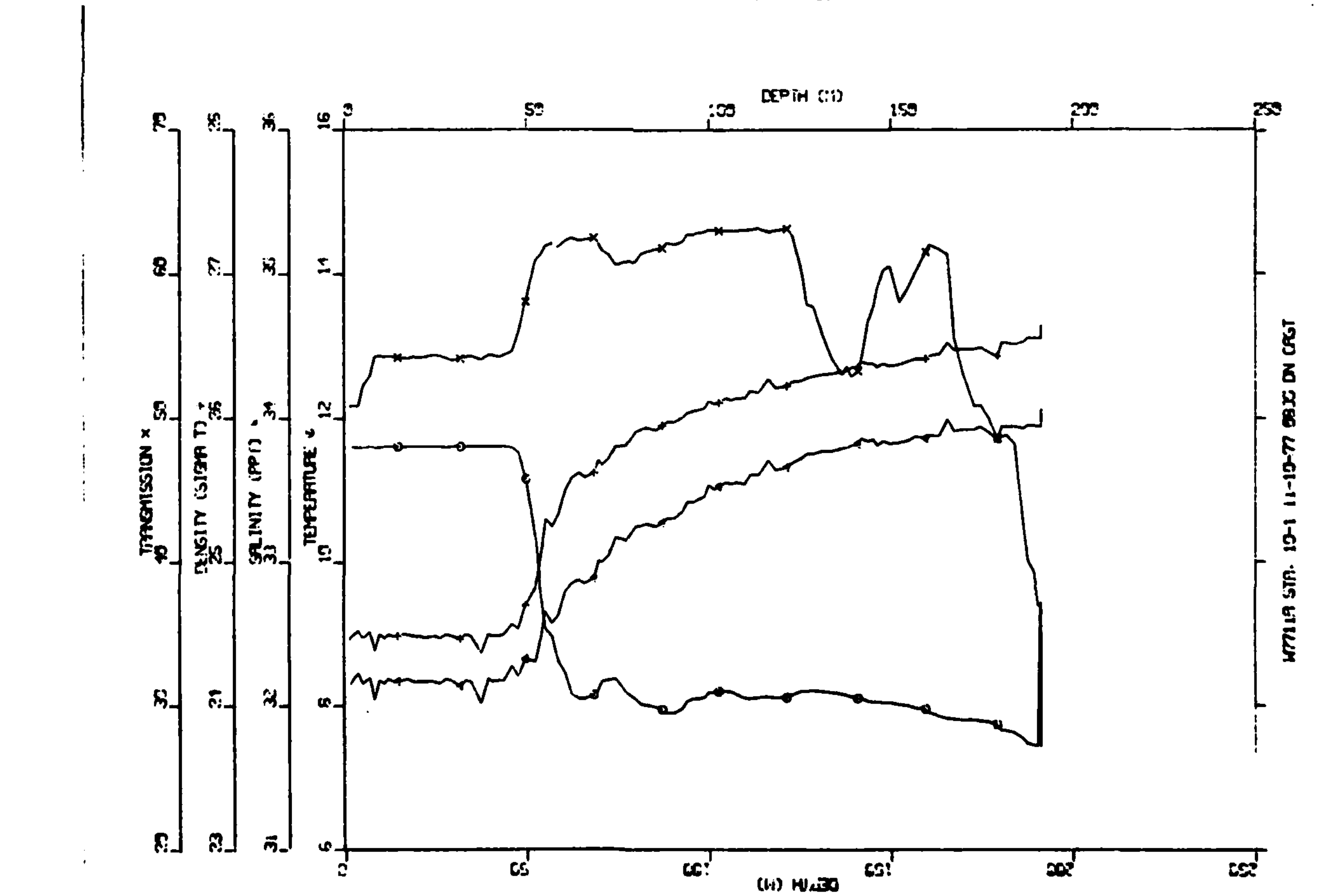

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 10-1 11-10-77 0830 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.61	32.19	24.50	52.16
10.0	11.61	32.15	24.48	54.31
15.0	11.62	32.18	24.50	54.23
20.0	11.62	32.17	24.49	54.24
25.0	11.62	32.17	24.49	54.33
30.0	11.62	32.17	24.49	54.13
35.0	11.62	32.14	24.46	54.26
40.0	11.62	32.17	24.48	54.38
45.0	11.60	32.23	24.54	54.72
50.0	10.95	32.31	24.72	58.58
60.0	8.50	32.74	25.45	62.23
70.0	8.26	32.99	25.69	62.00
80.0	8.11	33.23	25.89	61.04
90.0	7.92	33.32	25.99	62.16
100.0	8.17	33.51	26.10	63.06
110.0	8.13	33.57	26.15	63.08
120.0	8.13	33.66	26.23	63.03
130.0	8.21	33.77	26.30	56.63
140.0	8.12	33.82	26.36	53.27
150.0	8.04	33.83	26.37	59.75
160.0	7.93	33.87	26.42	61.52
170.0	7.81	33.92	26.48	52.98
180.0	7.70	33.91	26.48	48.86
190.0	7.69	33.95	26.55	38.25
191.3	7.94	34.03	26.62	37.05



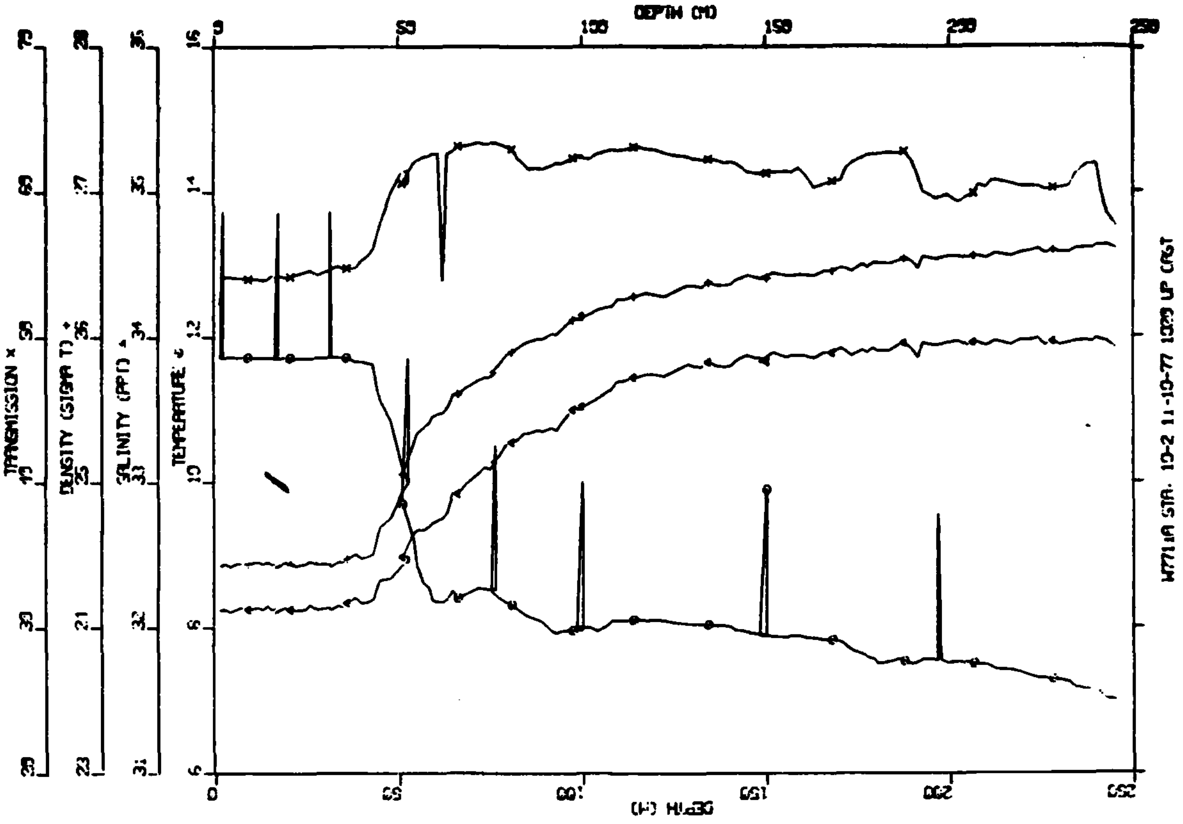
W7711A STA. 10-1 11-10-77 0830 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE

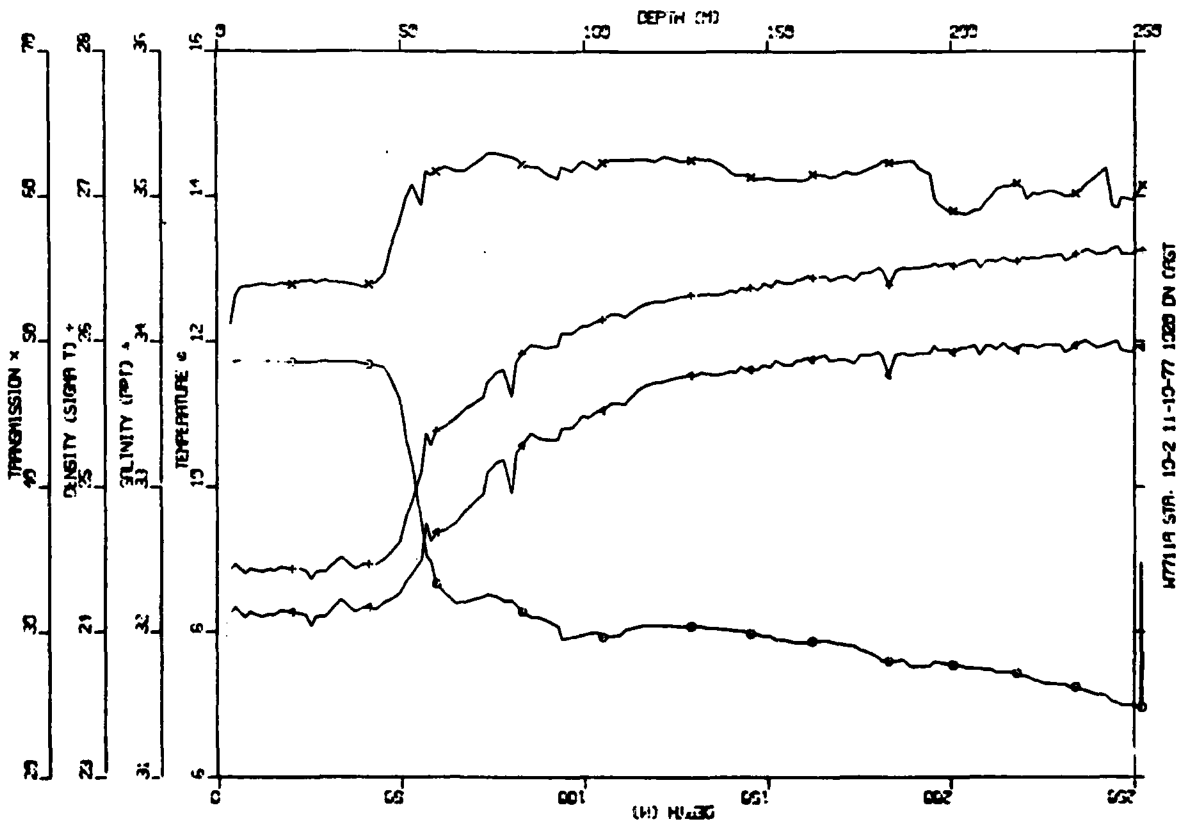


W7711A STA. 10-1 11-10-77 0830 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE

W7711A STA 10-2 11-10-77 1020 DN CAST

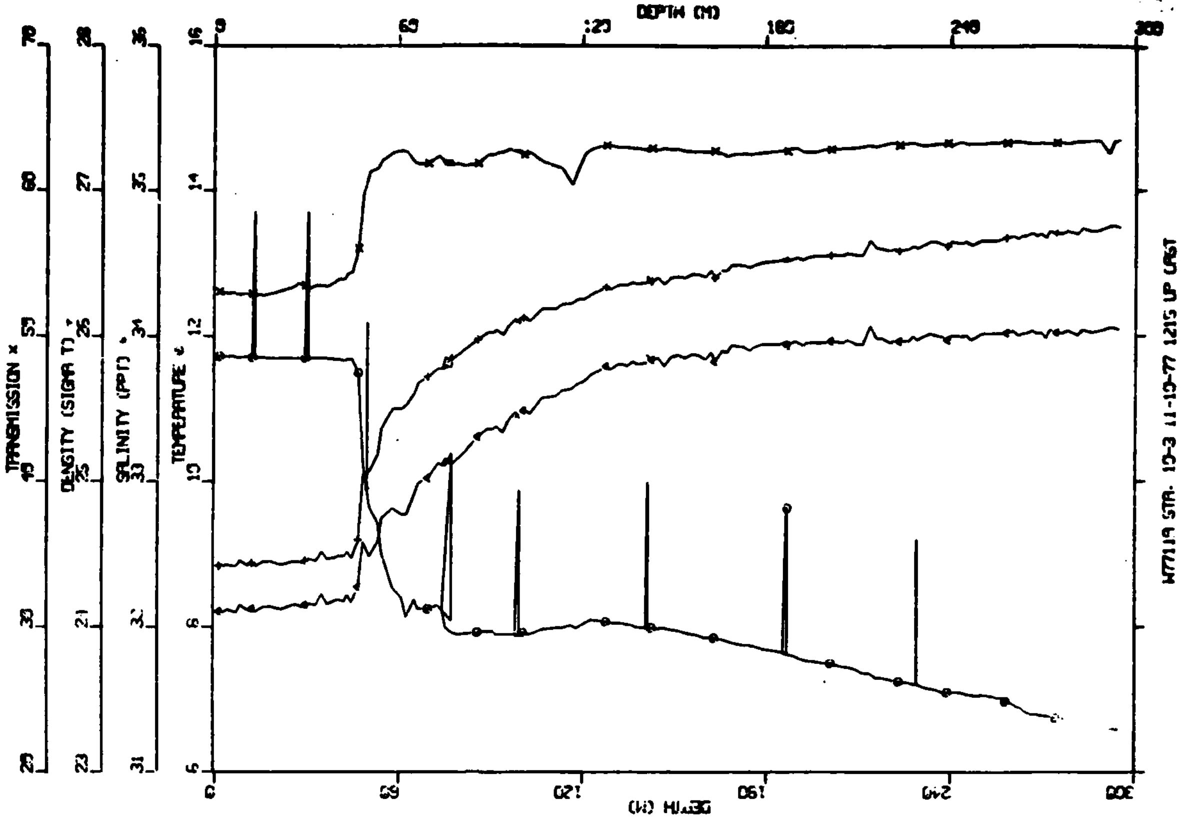
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.74	32.16	24.46	53.37
10.0	11.74	32.12	24.43	53.93
15.0	11.74	32.13	24.44	53.97
20.0	11.73	32.14	24.44	54.07
25.0	11.73	32.09	24.41	54.23
30.0	11.73	32.15	24.45	54.16
35.0	11.73	32.18	24.48	54.03
40.0	11.71	32.16	24.46	53.89
45.0	11.64	32.20	24.51	54.88
50.0	11.05	32.30	24.68	58.60
60.0	8.70	32.69	25.38	61.84
70.0	8.46	32.91	25.58	62.30
80.0	8.44	33.10	25.74	62.80
90.0	8.16	33.33	25.97	61.67
100.0	7.98	33.48	26.11	62.25
110.0	7.98	33.58	26.19	62.53
120.0	8.10	33.72	26.28	62.62
130.0	8.09	33.78	26.32	62.60
140.0	8.04	33.79	26.34	61.77
150.0	7.95	33.84	26.40	61.25
160.0	7.87	33.88	26.44	61.17
170.0	7.84	33.88	26.44	61.52
180.0	7.67	33.92	26.50	62.18
190.0	7.54	33.91	26.51	62.30
200.0	7.57	33.94	26.53	59.07
210.0	7.50	33.96	26.55	59.75
220.0	7.41	33.97	26.58	60.34
230.0	7.29	33.97	26.59	60.20
240.0	7.17	33.98	26.61	61.47
250.0	6.99	33.95	26.61	60.09
251.8	7.48	33.96	26.63	60.62


W7711A STA. 19-2 11-10-77 1920 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) Δ
TEMPERATURE C

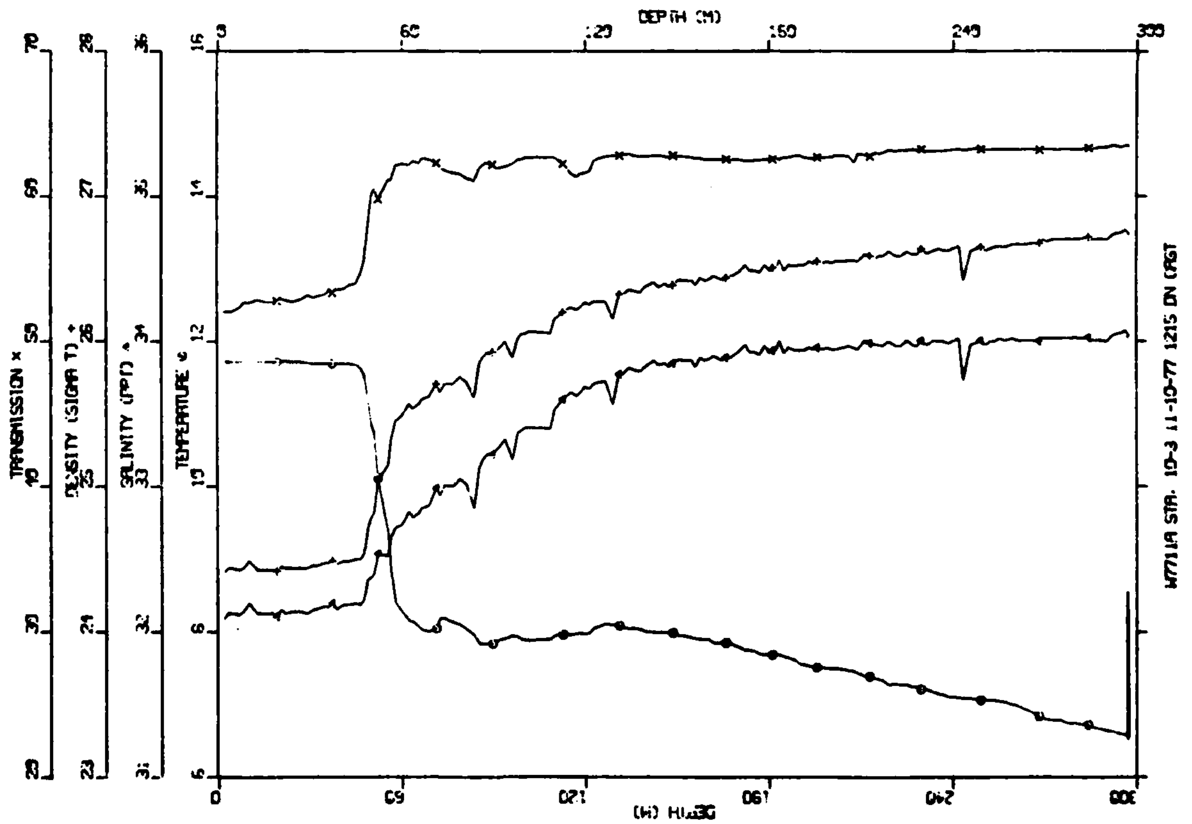

W7711A STA. 19-2 11-10-77 1920 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) Δ
TEMPERATURE C

W7711A STA 10-3 11-10-77 1215 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.73	32.13	24.44	51.36
10.0	11.74	32.17	24.46	52.78
15.0	11.73	32.14	24.43	52.83
20.0	11.73	32.14	24.44	52.90
25.0	11.73	32.14	24.44	52.90
30.0	11.72	32.15	24.46	53.14
35.0	11.70	32.17	24.48	53.34
40.0	11.70	32.18	24.49	53.65
45.0	11.68	32.20	24.50	54.22
50.0	10.88	32.39	24.80	59.79
60.0	8.29	32.76	25.50	62.24
70.0	8.06	32.92	25.65	62.46
80.0	8.08	33.02	25.73	61.45
90.0	7.88	33.25	25.94	62.14
100.0	7.91	33.40	26.06	62.65
110.0	7.95	33.52	26.14	62.59
120.0	7.99	33.68	26.26	61.72
130.0	8.10	33.69	26.25	62.84
140.0	8.02	33.83	26.38	62.82
150.0	7.97	33.86	26.41	62.80
160.0	7.89	33.88	26.43	62.62
170.0	7.80	33.94	26.49	62.56
180.0	7.69	33.94	26.51	62.61
190.0	7.59	33.79	26.40	62.83
200.0	7.50	33.95	26.55	62.76
210.0	7.43	33.98	26.58	62.84
220.0	7.30	33.99	26.61	63.17
230.0	7.23	33.99	26.62	63.22
240.0	7.11	33.98	26.63	63.22
250.0	7.07	34.00	26.64	63.27
260.0	7.00	34.02	26.67	63.29
270.0	6.82	34.02	26.70	63.25
280.0	6.75	34.03	26.71	63.29
290.0	6.66	34.02	26.71	63.44
296.8	7.04	34.03	26.74	63.48



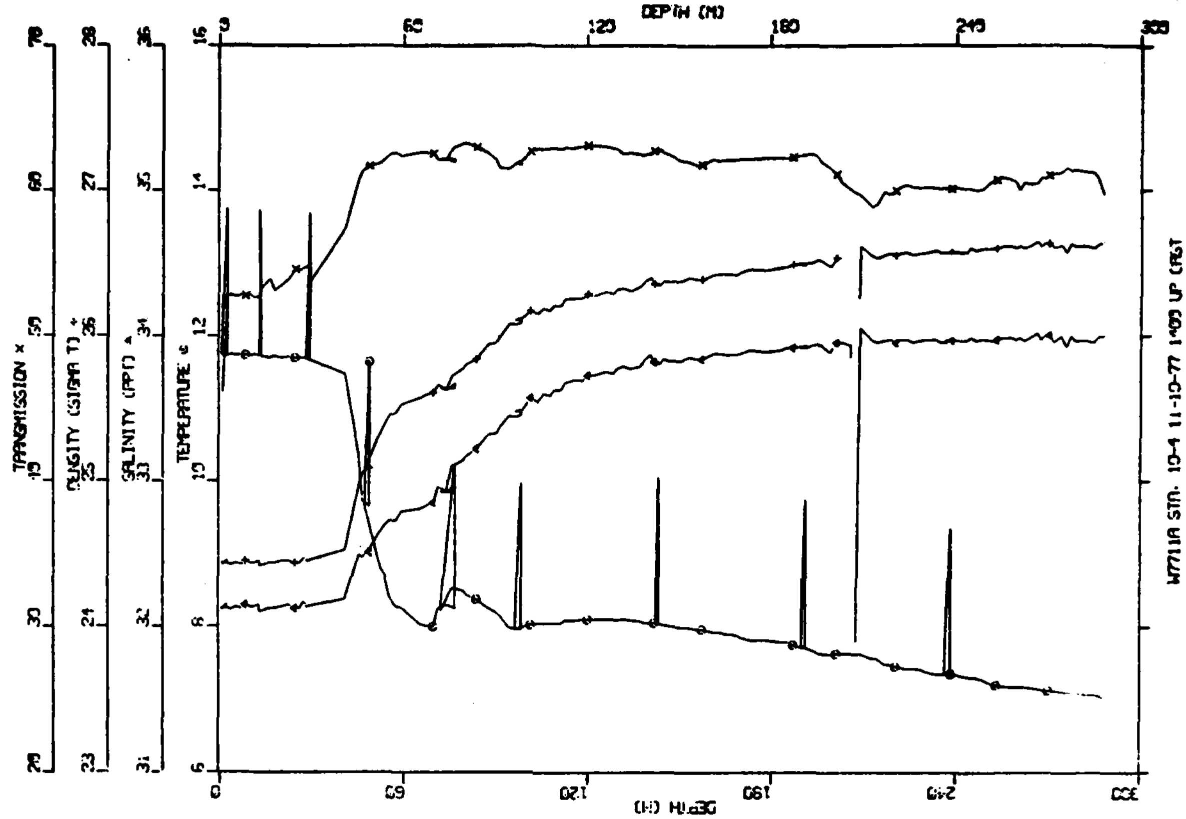
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE ¢
W7719 STA. 10-3 11-19-77 1215 UP CAST

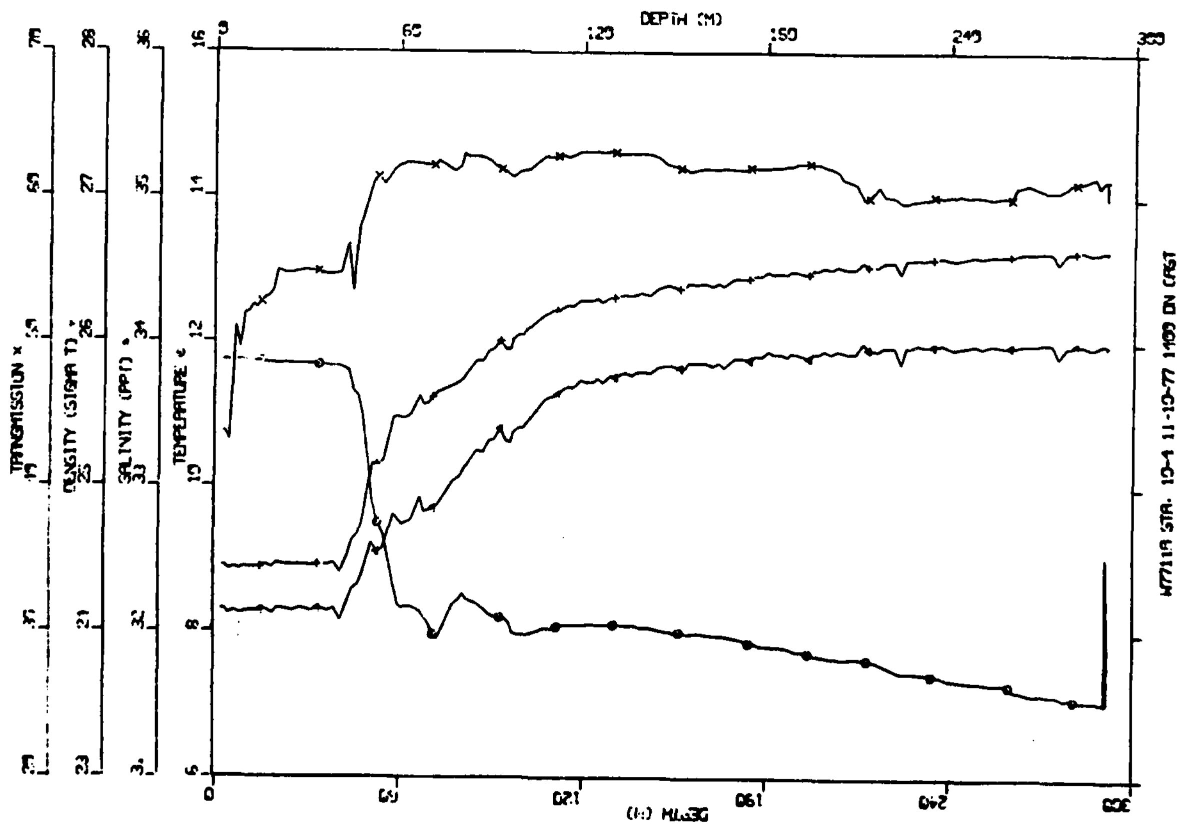


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE ¢
W7719 STA. 10-3 11-19-77 1215 DN CAST

W7711A STA 10-4 11-10-77 1400 DN CAST

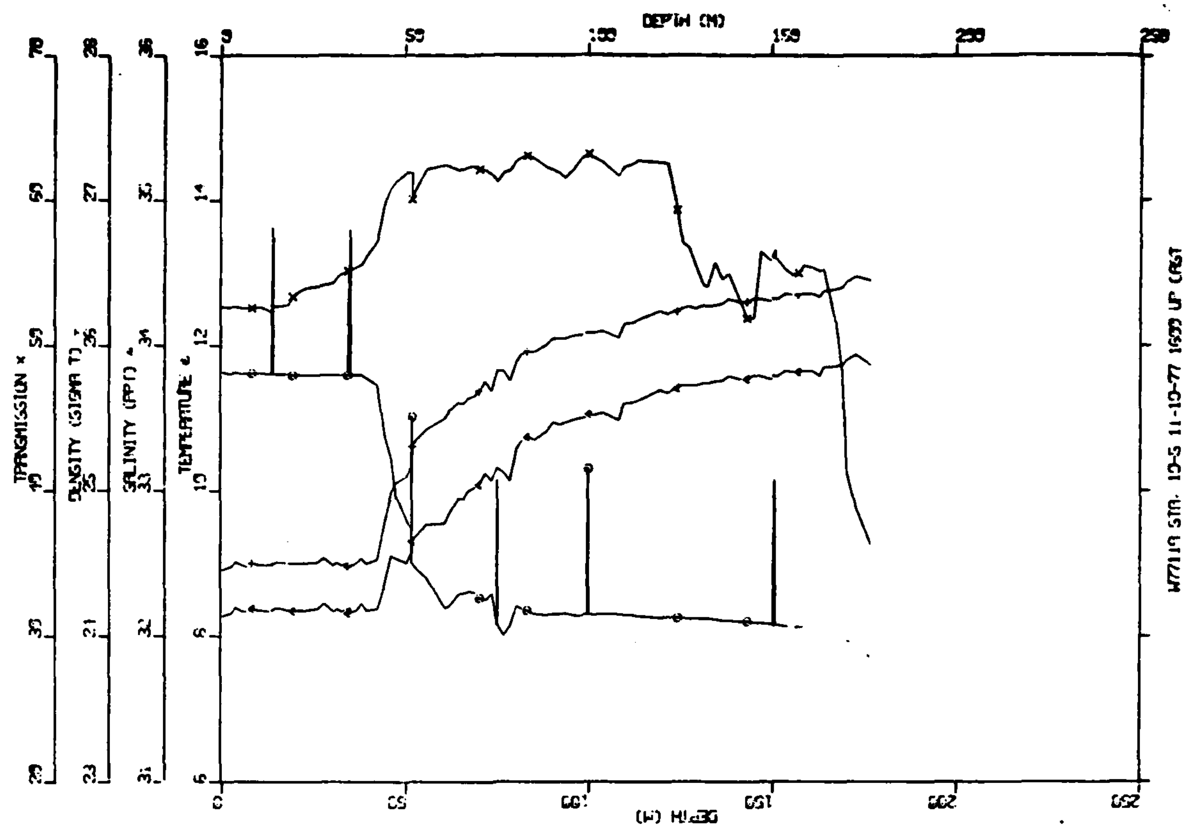
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.74	32.13	24.44	46.17
10.0	11.74	32.13	24.44	51.64
15.0	11.73	32.14	24.45	52.75
20.0	11.70	32.15	24.46	54.31
25.0	11.69	32.15	24.46	54.75
30.0	11.69	32.15	24.46	54.86
35.0	11.68	32.15	24.46	54.72
40.0	11.66	32.14	24.45	54.97
45.0	11.38	32.29	24.62	55.53
50.0	10.31	32.50	24.97	59.89
60.0	8.40	32.76	25.49	62.15
70.0	8.07	32.85	25.60	62.22
80.0	8.47	33.10	25.74	62.40
90.0	8.25	33.33	25.95	62.33
100.0	7.97	33.42	26.06	61.75
110.0	8.07	33.63	26.22	62.79
120.0	8.11	33.73	26.29	63.13
130.0	8.10	33.77	26.31	63.09
140.0	8.07	33.80	26.34	62.97
150.0	8.01	33.84	26.39	62.17
160.0	7.98	33.86	26.40	61.99
170.0	7.92	33.88	26.43	61.98
180.0	7.82	33.93	26.48	62.05
190.0	7.75	33.92	26.49	62.29
200.0	7.67	33.94	26.52	62.12
210.0	7.65	33.96	26.53	60.54
220.0	7.54	33.96	26.55	60.12
230.0	7.45	33.98	26.58	59.86
240.0	7.37	33.97	26.58	60.12
250.0	7.33	33.98	26.60	60.10
260.0	7.26	33.98	26.60	60.26
270.0	7.17	34.00	26.63	60.57
280.0	7.11	33.99	26.63	60.98
290.0	7.07	34.00	26.64	61.17
291.0	7.55	33.98	26.63	60.36


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙
W7711A STA. 10-4 11-19-77 1400 UP CAST

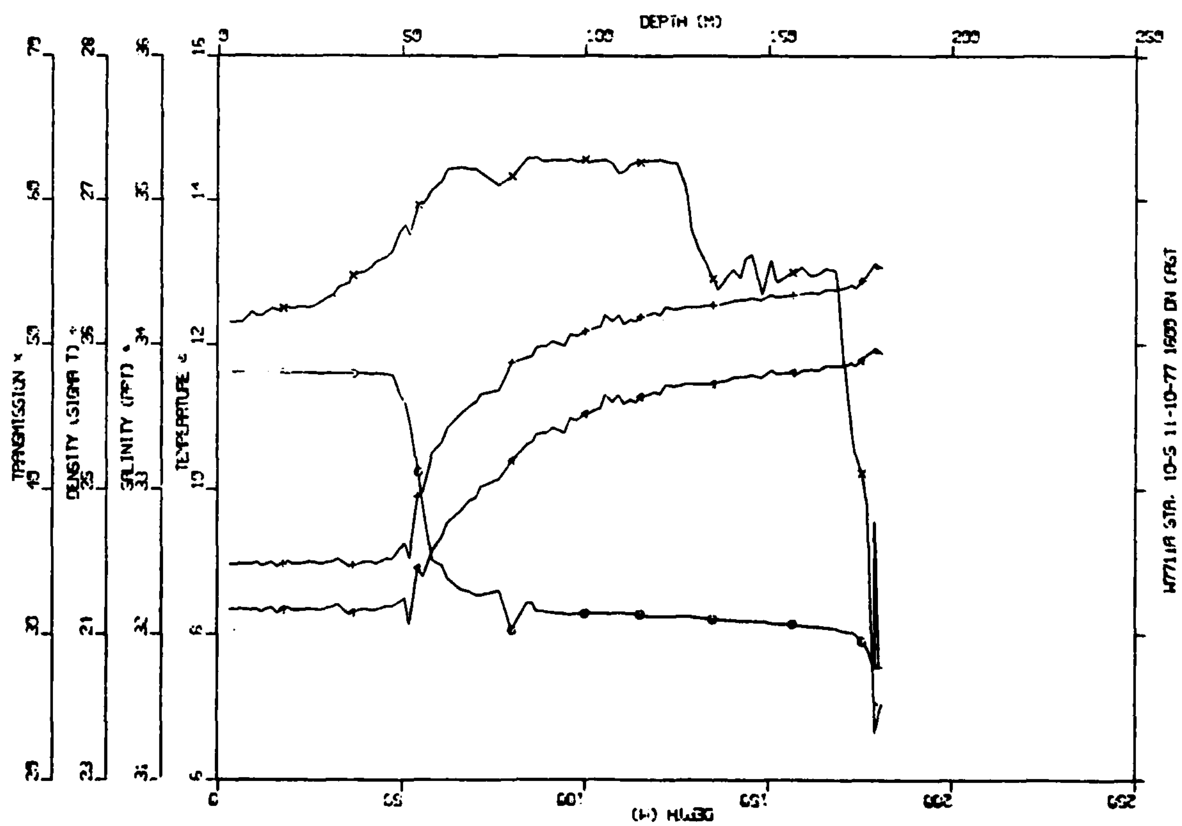

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙
W7711A STA. 10-4 11-19-77 1400 DN CAST

W7711A STA 10-5 11-10-77 1600 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.63	32.18	24.49	48.65
10.0	11.62	32.17	24.49	52.09
15.0	11.62	32.18	24.49	52.44
20.0	11.62	32.18	24.50	52.59
25.0	11.62	32.18	24.50	52.68
30.0	11.61	32.19	24.50	53.33
35.0	11.60	32.16	24.49	54.28
40.0	11.60	32.18	24.50	55.16
45.0	11.59	32.19	24.51	56.03
50.0	11.25	32.22	24.59	57.79
60.0	9.01	32.64	25.30	61.17
70.0	8.57	32.96	25.62	62.10
80.0	8.30	33.20	25.84	61.80
90.0	8.31	33.40	26.00	62.73
100.0	8.29	33.51	26.08	62.71
110.0	8.30	33.62	26.17	62.06
120.0	8.25	33.68	26.22	62.75
130.0	8.25	33.73	26.26	57.48
140.0	8.20	33.77	26.30	54.81
150.0	8.18	33.80	26.33	54.79
160.0	8.13	33.82	26.35	55.04
170.0	8.07	33.86	26.39	50.23
180.0	8.03	33.95	26.54	25.66
181.1	7.57	33.95	26.54	24.79



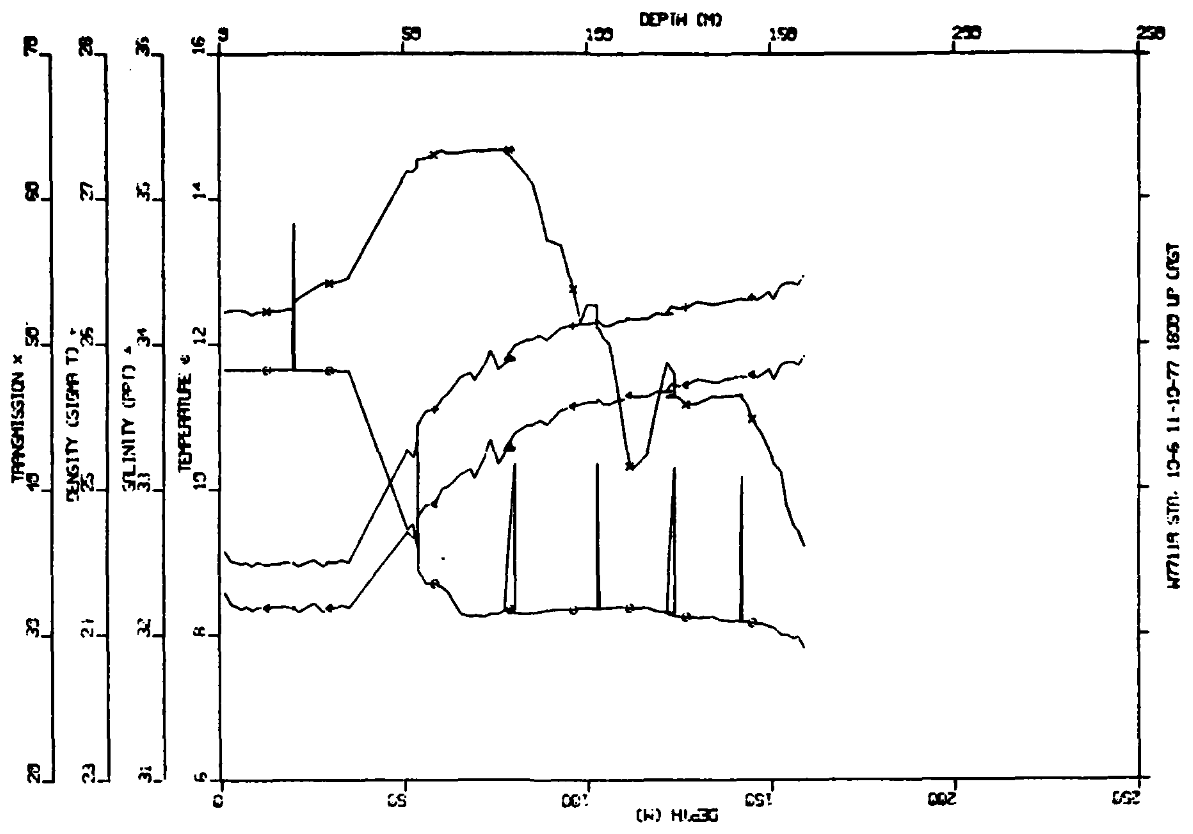
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE c
H7711A STA. 10-5 11-10-77 1600 UP CAST

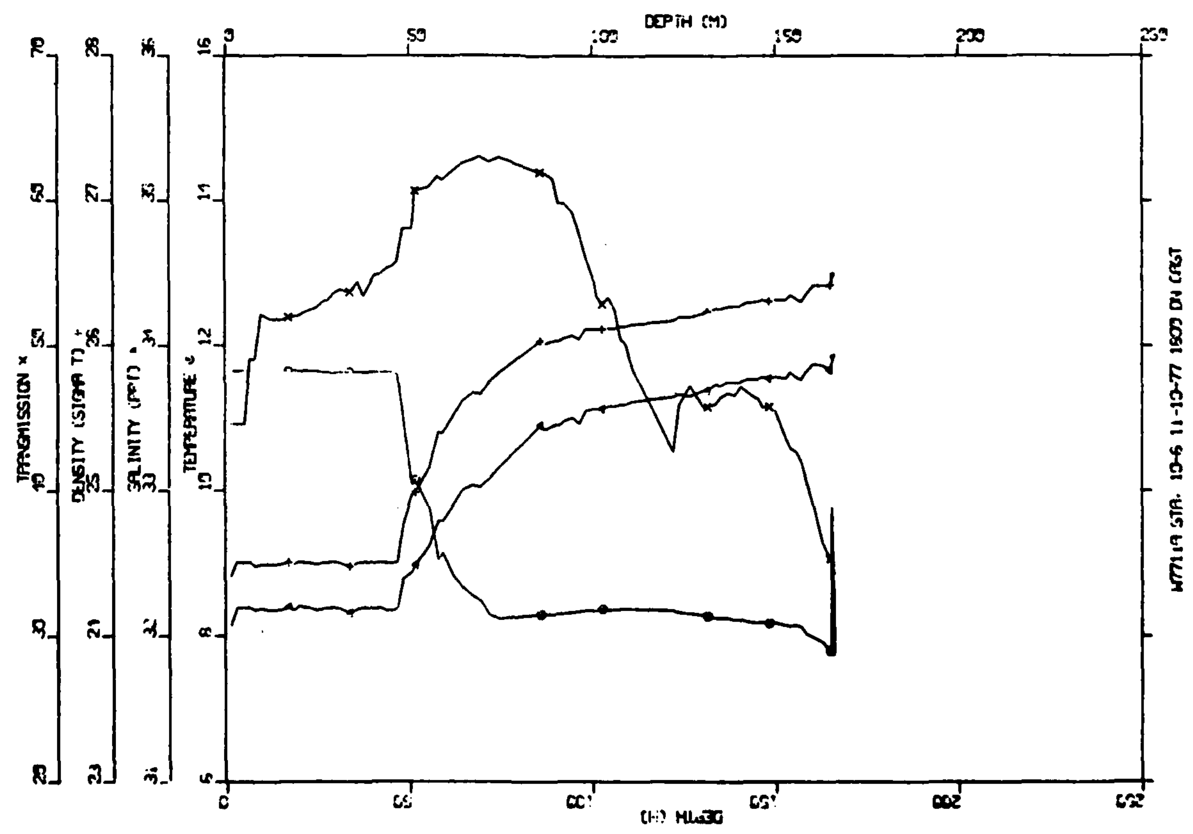


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE c
H7711A STA. 10-5 11-10-77 1600 DN CAST

W7711A STA 10-6 11-10-77 1800 DN CAST

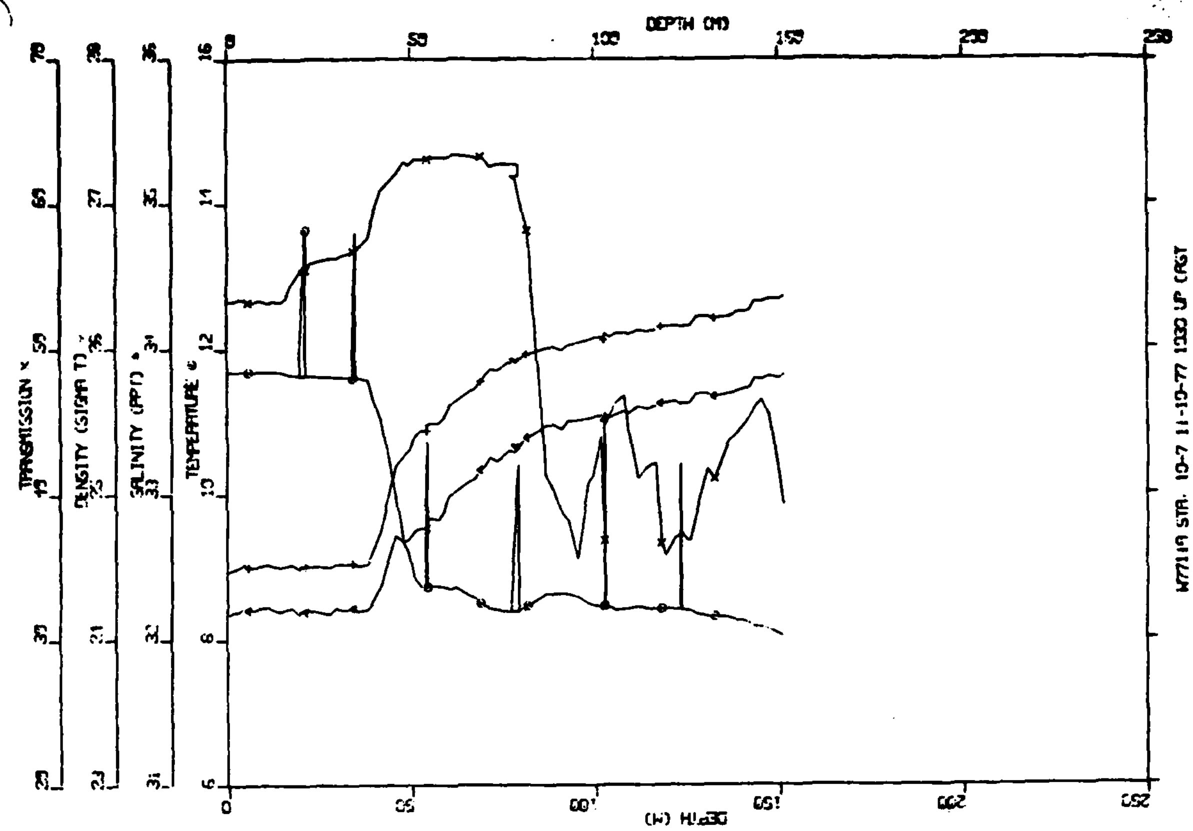
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.67	32.20	24.51	43.42
10.0	11.66	32.19	24.49	51.56
15.0	11.67	32.19	24.49	51.85
20.0	11.66	32.20	24.50	52.14
25.0	11.65	32.19	24.50	52.78
30.0	11.64	32.20	24.51	53.69
35.0	11.64	32.19	24.50	53.98
40.0	11.64	32.20	24.51	54.45
45.0	11.64	32.19	24.50	55.51
50.0	10.50	32.42	24.88	58.44
60.0	9.01	32.85	25.46	61.78
70.0	8.44	33.06	25.71	62.91
80.0	8.30	33.30	25.92	62.51
90.0	8.32	33.46	26.05	60.87
100.0	8.35	33.57	26.12	54.93
110.0	8.38	33.62	26.15	48.94
120.0	8.36	33.64	26.17	45.85
130.0	8.30	33.69	26.23	46.18
140.0	8.23	33.76	26.29	46.97
150.0	8.18	33.57	26.15	45.21
160.0	8.01	33.85	26.40	39.29
166.2	7.75	33.93	26.49	34.51

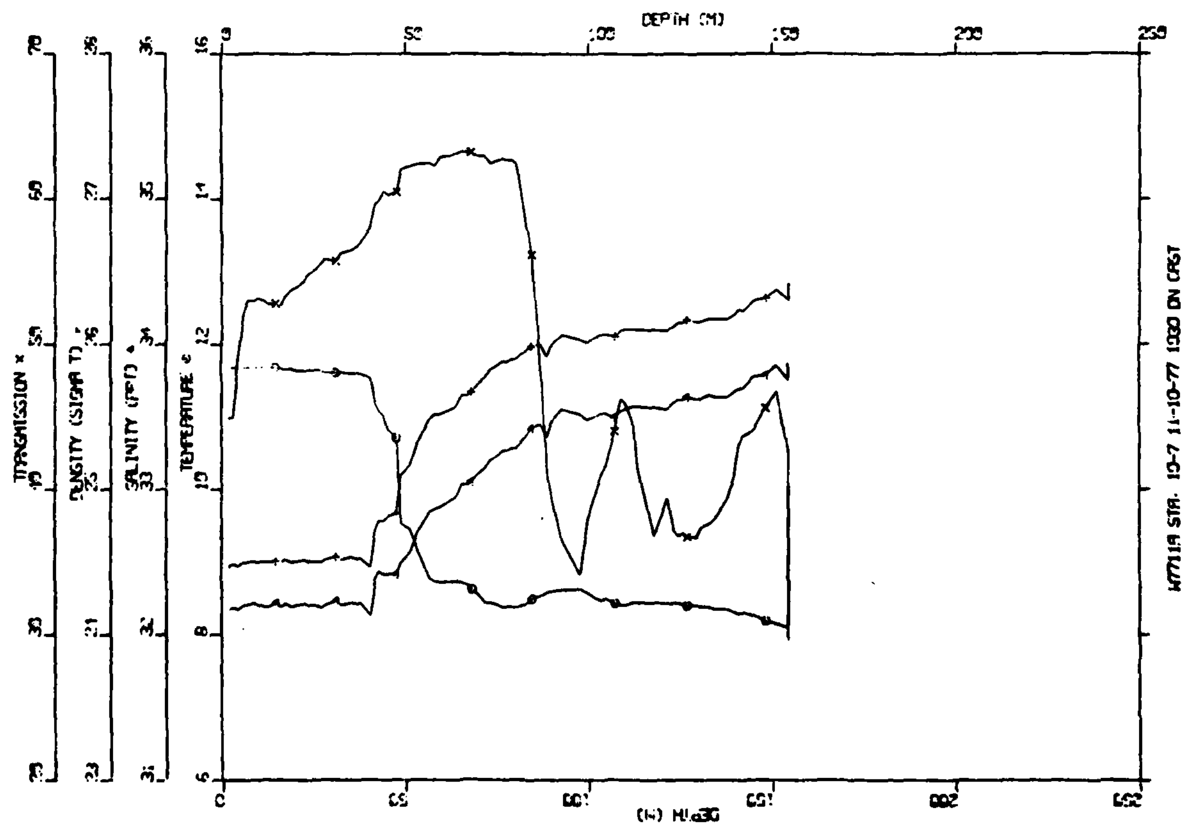

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ◆
W7711A STN. 10-6 11-10-77 1800 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ◆
W7711A STA. 10-6 11-10-77 1800 DN CAST

W7711A STA 10-7 11-10-77 1930 DN CAST

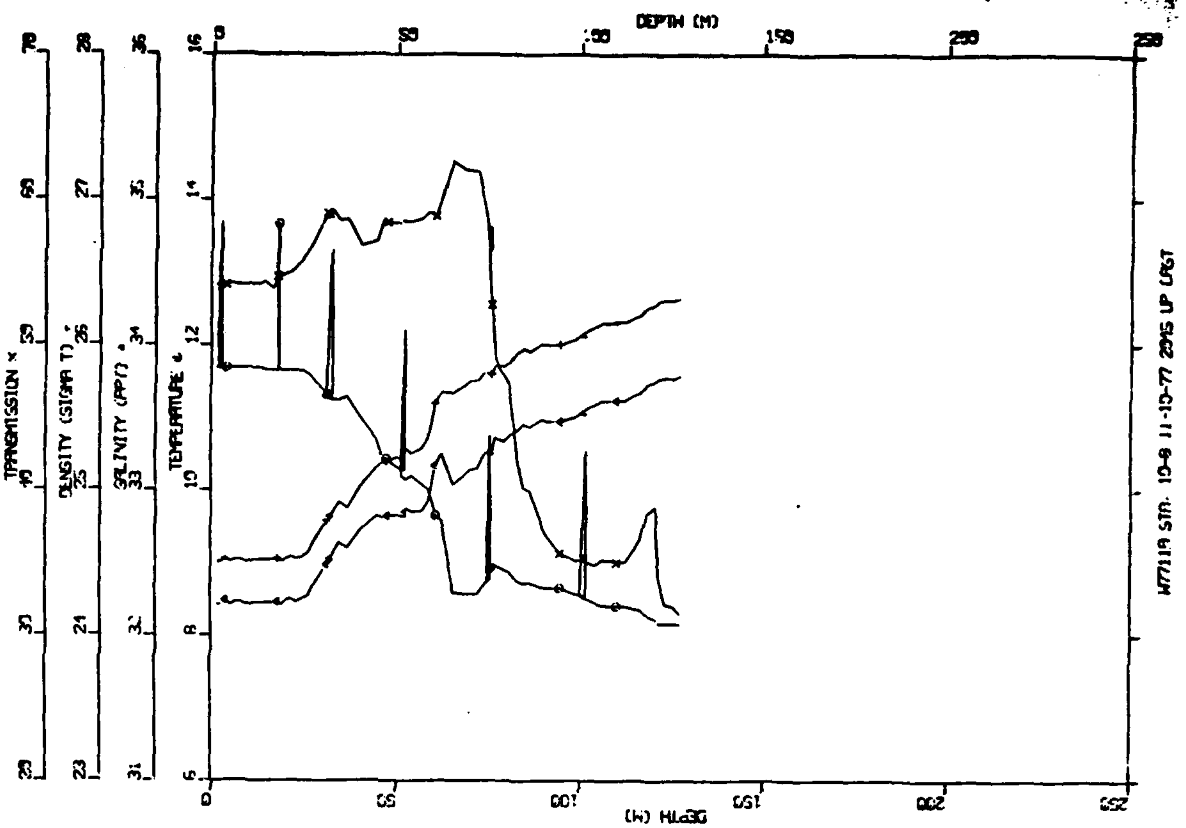
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.69	32.20	24.50	50.36
10.0	11.69	32.21	24.50	53.07
15.0	11.69	32.21	24.51	52.85
20.0	11.67	32.21	24.51	54.01
25.0	11.65	32.21	24.51	55.12
30.0	11.63	32.23	24.53	55.91
35.0	11.62	32.22	24.53	56.52
40.0	11.50	32.22	24.55	58.05
45.0	10.87	32.42	24.82	60.39
50.0	9.61	32.55	25.13	62.05
60.0	8.75	32.90	25.54	62.87
70.0	8.55	33.12	25.74	63.04
80.0	8.40	33.31	25.91	61.95
90.0	8.62	33.48	26.01	39.02
100.0	8.58	33.51	26.03	37.86
110.0	8.43	33.56	26.11	45.74
120.0	8.45	33.57	26.11	38.44
130.0	8.40	33.64	26.17	37.12
140.0	8.31	33.69	26.22	41.62
150.0	8.17	33.82	26.34	45.50
154.5	8.47	33.84	26.39	36.51

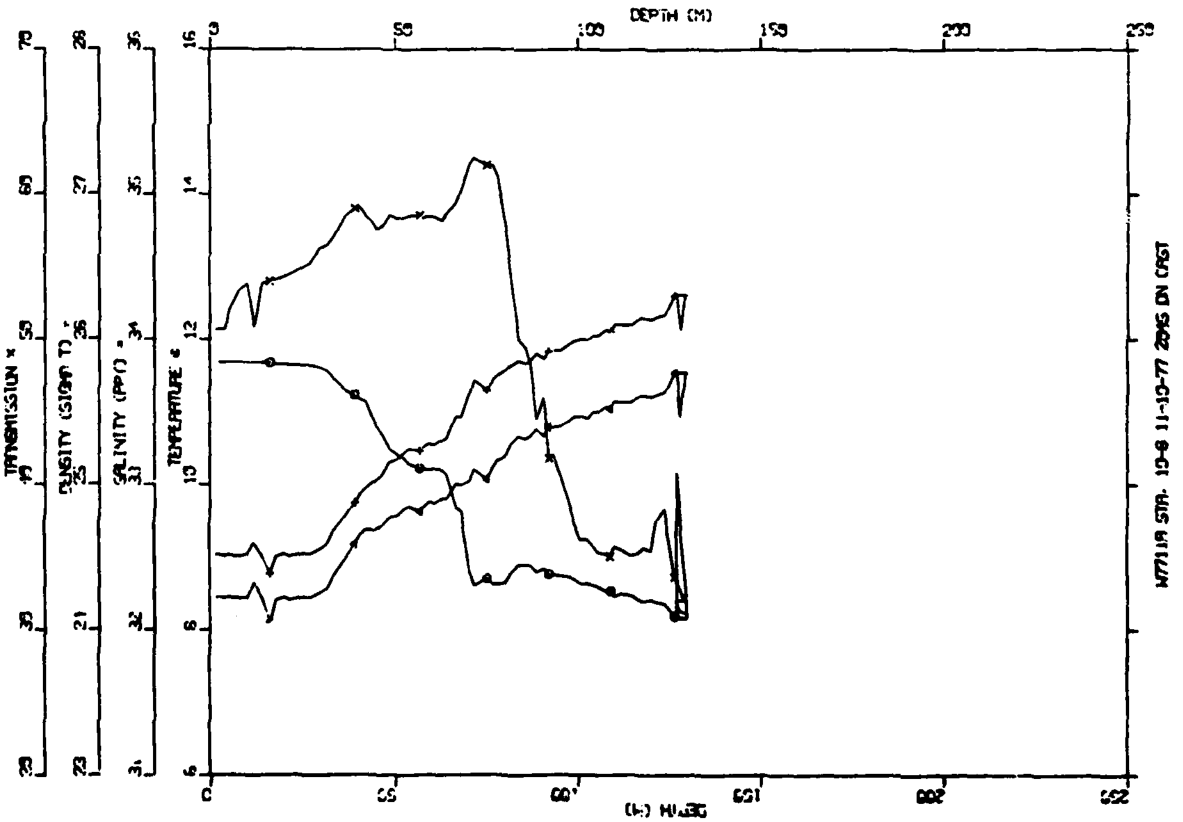

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE c
W7719 STA. 19-7 11-10-77 1930 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE c
W7719 STA. 19-7 11-10-77 1930 DN CAST

W7711A STA 10-8 11-10-77 2045 DN CAST

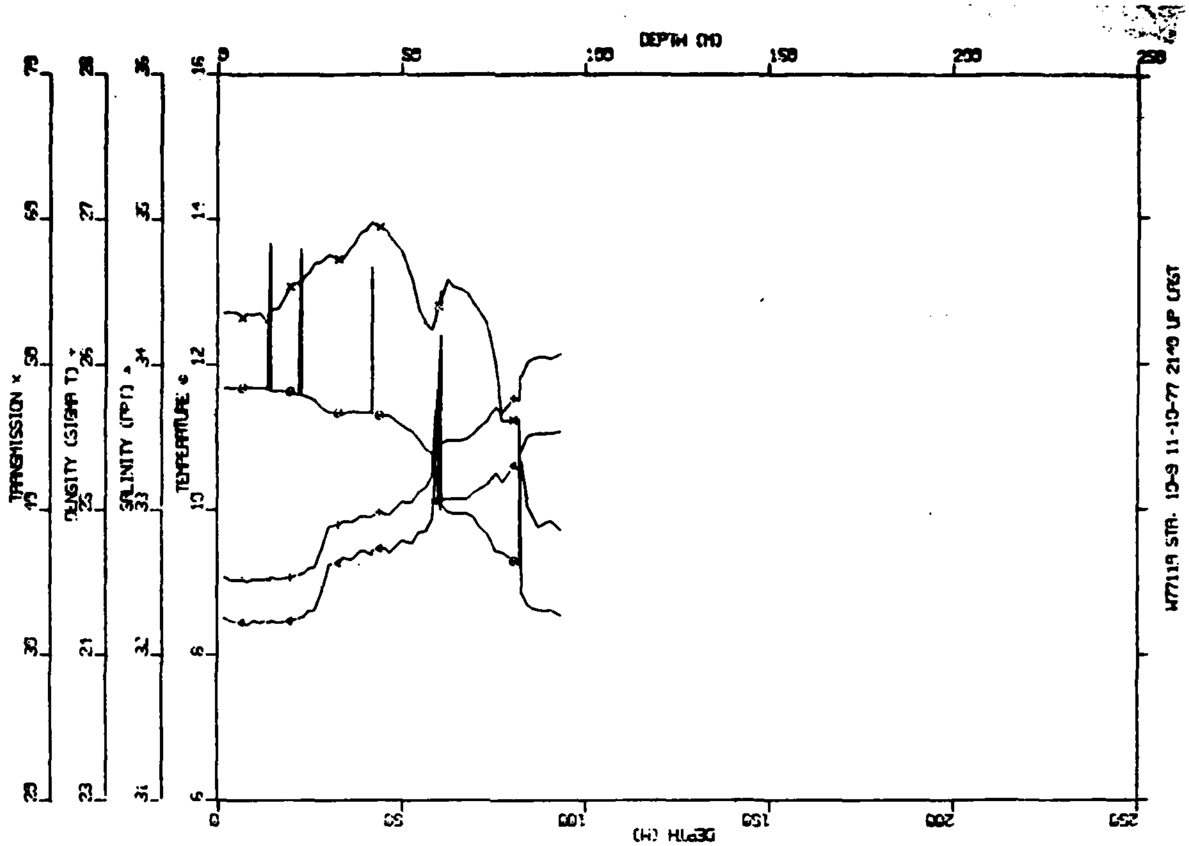
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.69	32.23	24.52	51.89
10.0	11.69	32.25	24.54	52.98
15.0	11.69	32.17	24.47	53.66
20.0	11.67	32.22	24.52	54.35
25.0	11.66	32.23	24.53	54.96
30.0	11.61	32.28	24.58	56.32
35.0	11.39	32.45	24.75	57.87
40.0	11.20	32.64	24.93	58.94
45.0	10.81	32.71	25.05	57.79
50.0	10.46	32.80	25.18	58.43
60.0	10.23	32.89	25.29	58.41
70.0	9.00	33.04	25.60	61.68
80.0	8.70	33.23	25.79	57.66
90.0	8.83	33.37	25.89	45.02
100.0	8.67	33.47	26.00	36.86
110.0	8.50	33.57	26.10	35.55
120.0	8.41	33.62	26.15	36.03
129.3	8.16	33.70	26.25	31.24

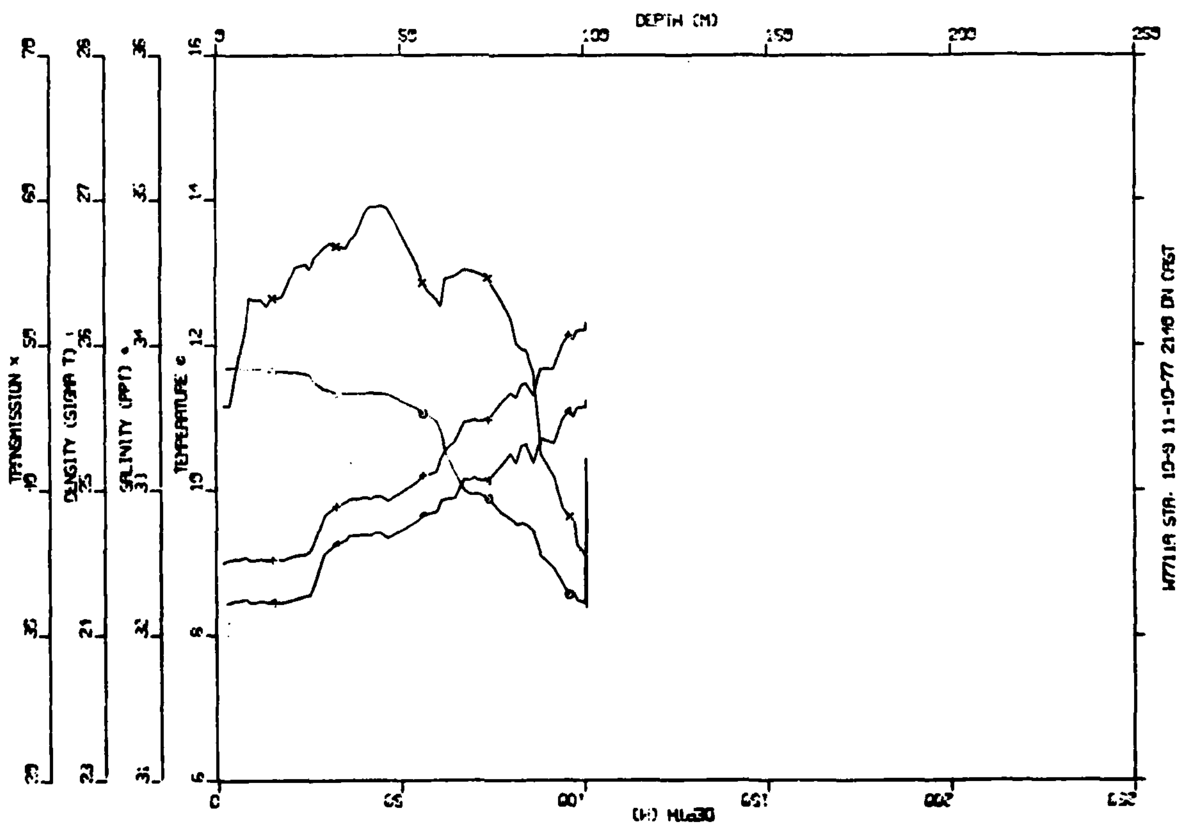

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ◦
TEMPERATURE ◇
W7719 STA. 10-8 11-10-77 2045 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ◦
TEMPERATURE ◇
W7719 STA. 10-8 11-10-77 2045 DN CAST

W77§1A STA 10-9 11-10-77 2140 DN CAST

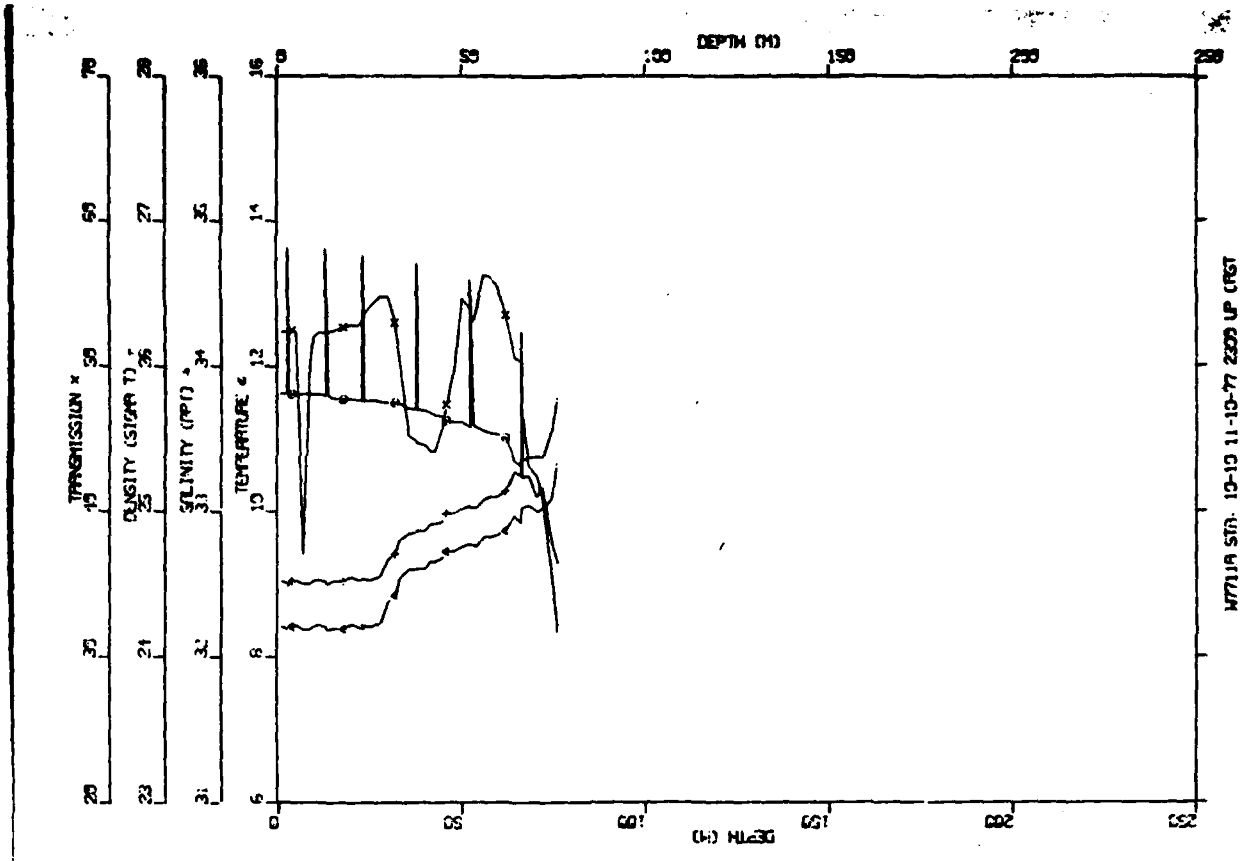
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.70	32.24	24.53	47.92
10.0	11.69	32.23	24.52	53.19
15.0	11.66	32.23	24.52	53.15
20.0	11.65	32.24	24.54	54.55
25.0	11.59	32.30	24.59	55.52
30.0	11.40	32.19	24.55	56.81
35.0	11.34	32.65	24.91	56.89
40.0	11.35	32.70	24.95	58.71
45.0	11.33	32.70	24.95	59.36
50.0	11.25	32.74	25.00	57.73
60.0	10.93	32.87	25.16	53.24
70.0	9.96	33.08	25.49	55.07
80.0	9.61	33.22	25.65	51.84
90.0	9.05	33.34	25.84	42.26
100.0	8.87	33.58	26.11	35.95
100.8	8.91	33.62	26.15	33.40

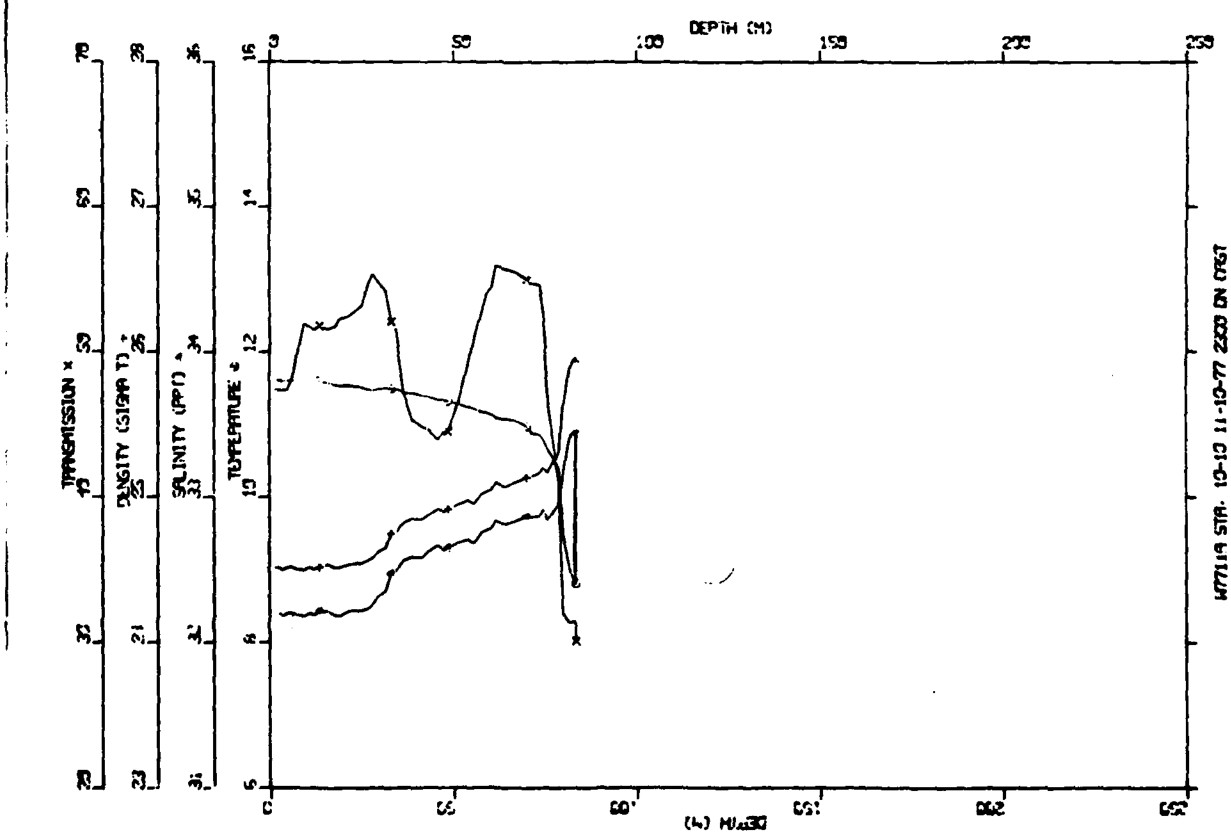

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A STA. 10-9 11-10-77 2149 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A STA. 10-9 11-10-77 2149 DN CAST

W7[illegible]1A STA 10-10 11-10-77 2300 DN CAST

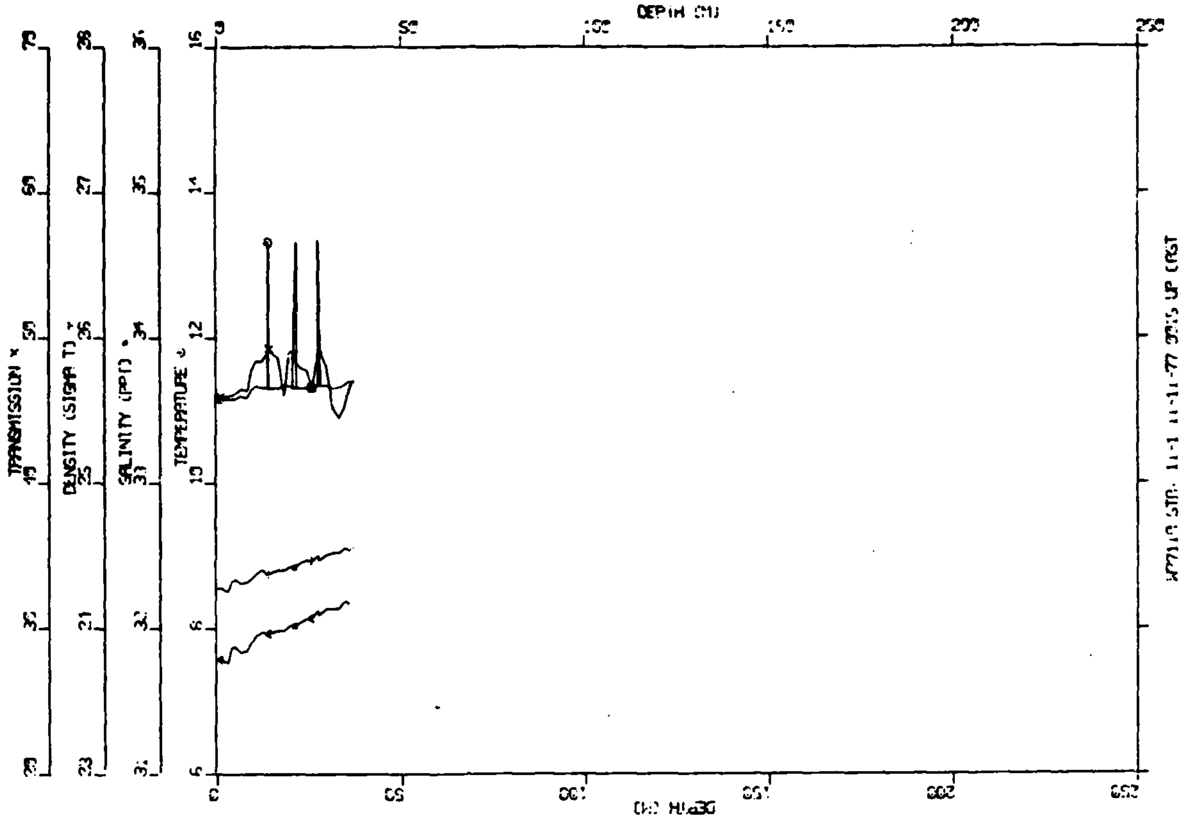
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.62	32.21	24.52	44.71
10.0	11.63	32.20	24.51	51.55
15.0	11.60	32.22	24.53	51.72
20.0	11.56	32.21	24.54	52.42
25.0	11.53	32.23	24.55	53.45
30.0	11.51	32.34	24.64	54.49
35.0	11.50	32.53	24.79	49.64
40.0	11.44	32.59	24.85	45.14
45.0	11.38	32.65	24.90	44.40
50.0	11.31	32.68	24.94	45.99
60.0	11.16	32.79	25.05	54.47
70.0	11.00	32.86	25.14	55.10
80.0	9.56	33.20	25.65	33.90
83.3	9.35	33.45	25.94	30.57

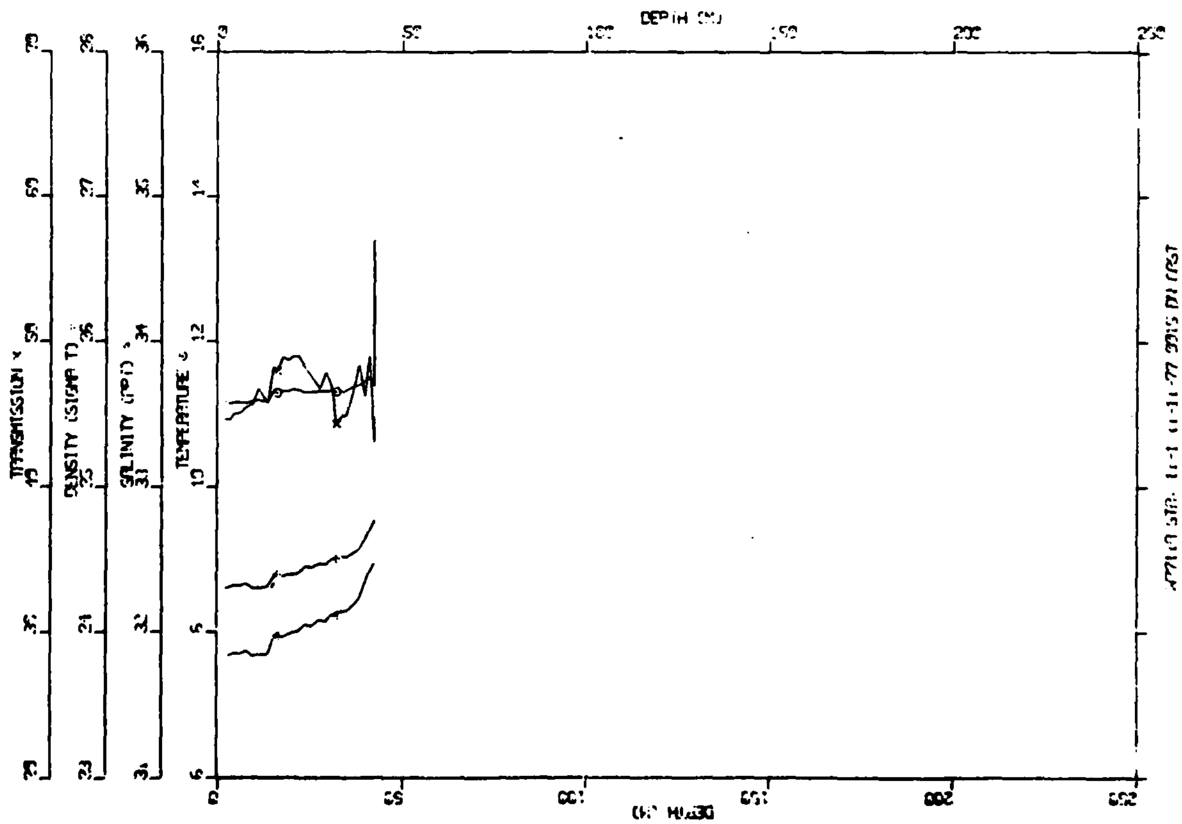

DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A STA. 10-10 11-10-77 2309 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A STA. 10-10 11-10-77 2300 DN CAST

W77-11A STA 11-1 11-11-77 0015 DN CAST

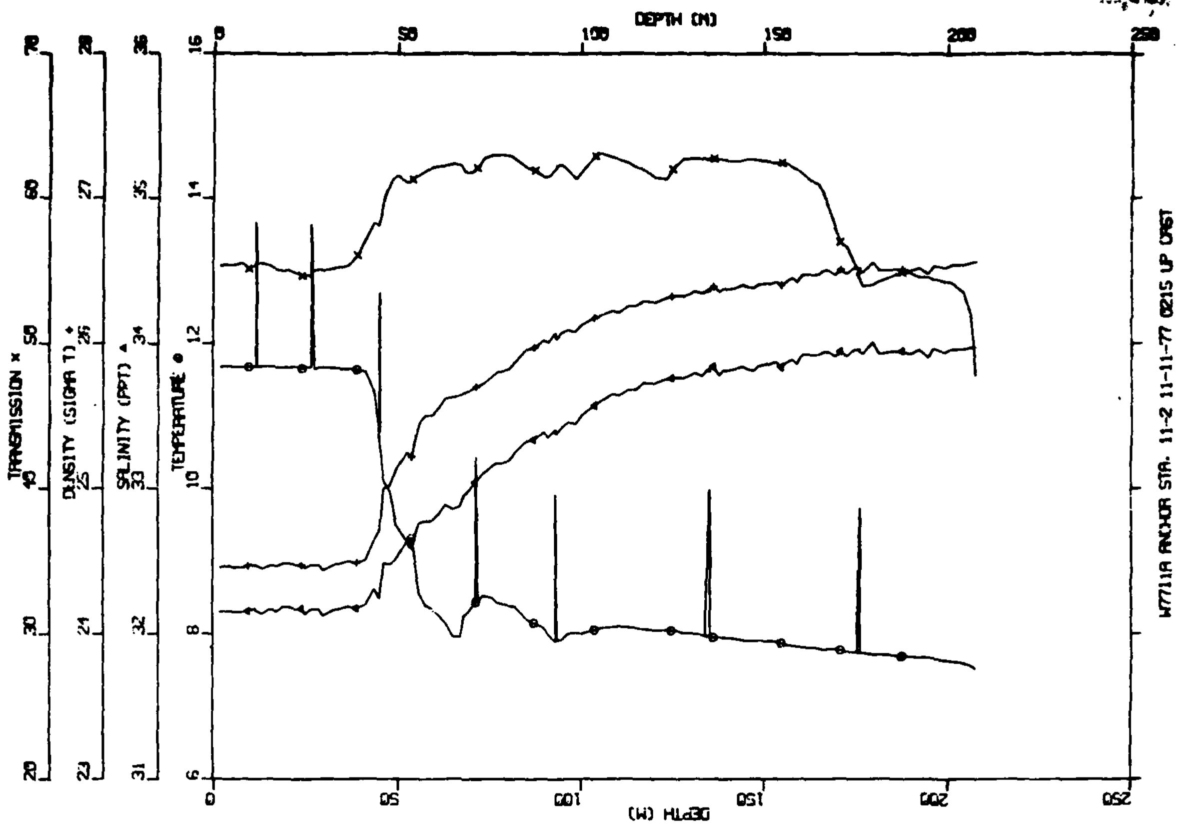
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.18	31.86	24.33	45.08
10.0	11.19	31.85	24.32	46.08
15.0	11.29	31.94	24.37	47.64
20.0	11.34	32.00	24.40	48.94
25.0	11.32	32.06	24.46	47.70
30.0	11.33	32.11	24.49	46.92
35.0	11.36	32.17	24.53	45.65
40.0	11.47	32.36	24.66	47.31
42.1	11.92	32.47	24.76	44.38

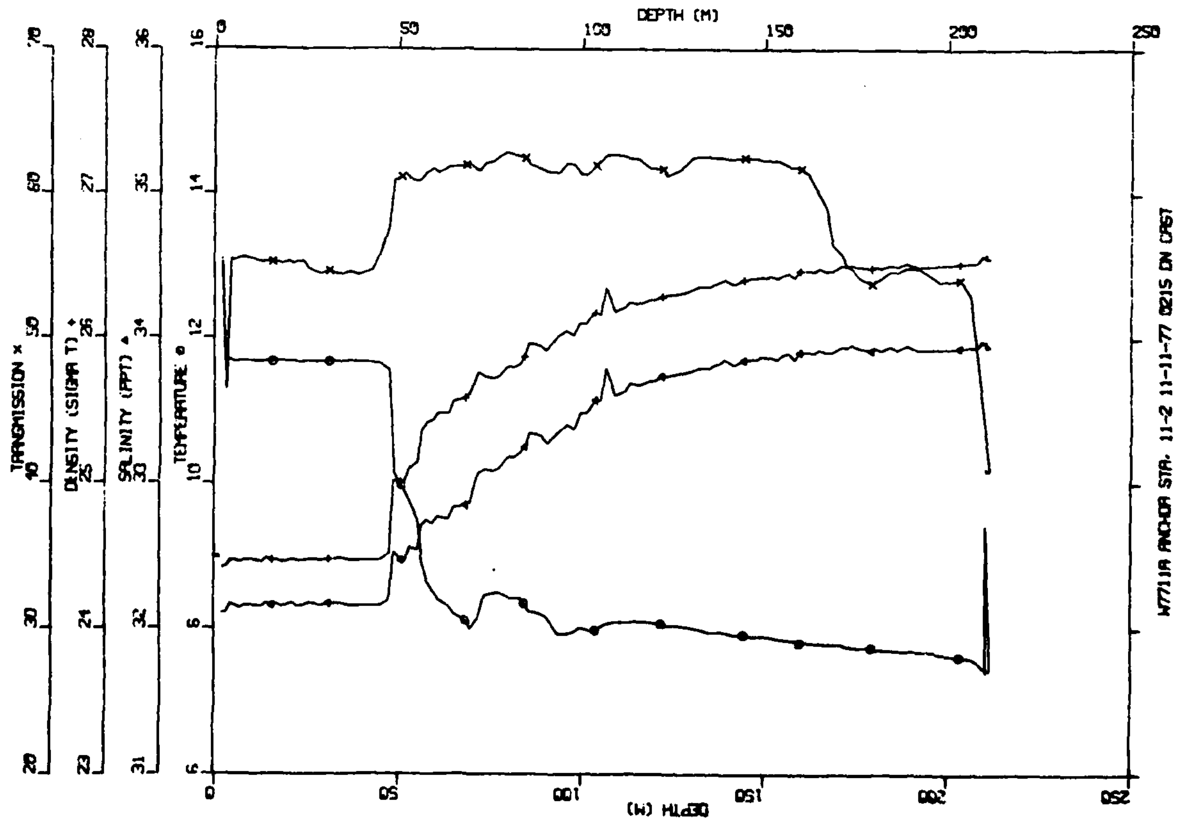

TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
DEPTH (M)
UP CAST


TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
DEPTH (M)

W77[illegible]1A STA 11-2 11-11-77 0215 DN CAST

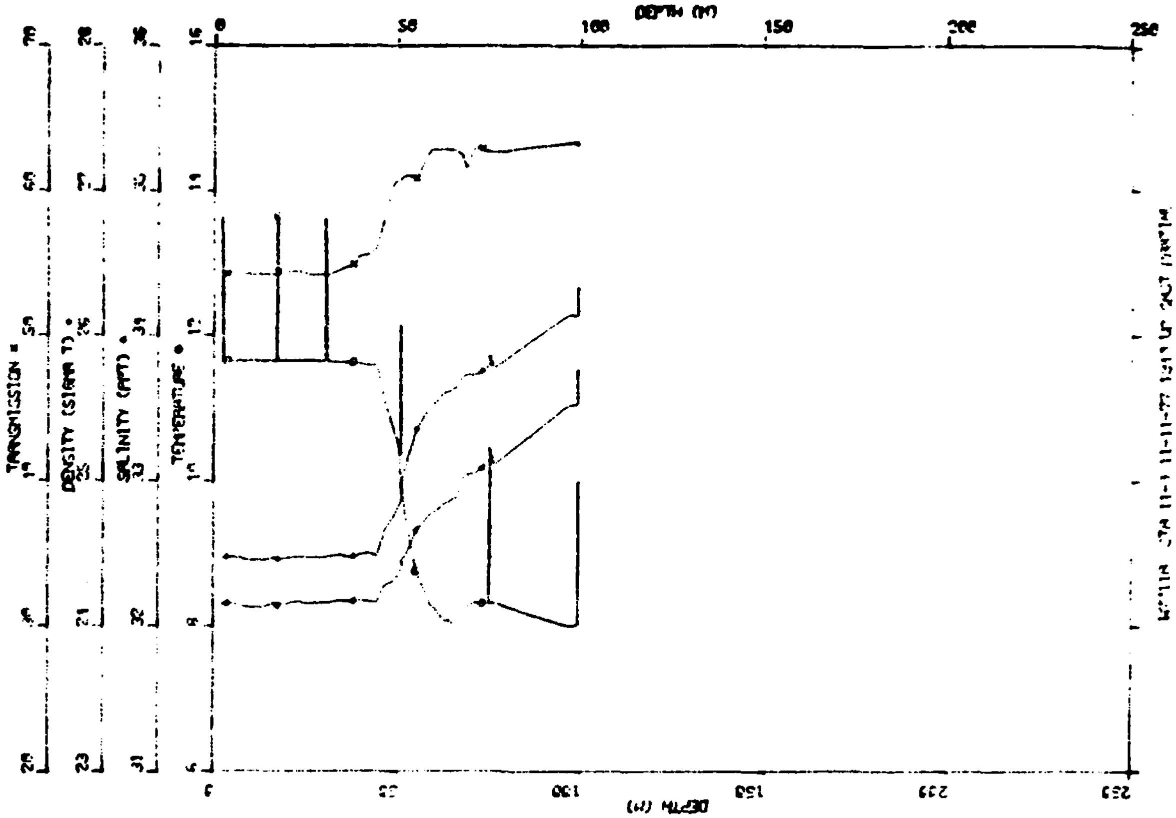
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.69	32.16	24.47	54.32
10.0	11.68	32.16	24.47	55.47
15.0	11.69	32.17	24.48	55.27
20.0	11.69	32.17	24.47	55.25
25.0	11.69	32.17	24.48	54.98
30.0	11.68	32.17	24.48	54.57
35.0	11.68	32.17	24.48	54.50
40.0	11.68	32.16	24.47	54.52
45.0	11.64	32.17	24.48	56.01
50.0	10.15	32.47	24.97	60.85
60.0	8.48	32.76	25.47	61.64
70.0	8.12	32.96	25.68	61.88
80.0	8.45	33.18	25.80	62.82
90.0	8.13	33.32	25.96	61.62
100.0	8.00	33.47	26.10	61.52
110.0	8.09	33.65	26.23	62.69
120.0	8.08	33.72	26.28	61.77
130.0	8.02	33.78	26.34	62.30
140.0	7.94	33.84	26.40	62.48
150.0	7.89	33.88	26.43	62.37
160.0	7.82	33.90	26.46	61.71
170.0	7.79	33.93	26.49	56.32
180.0	7.74	33.93	26.50	54.02
190.0	7.70	33.94	26.51	54.92
200.0	7.65	33.94	26.52	54.04
210.0	7.58	33.97	26.56	44.67
210.4	7.92	33.98	26.58	41.06

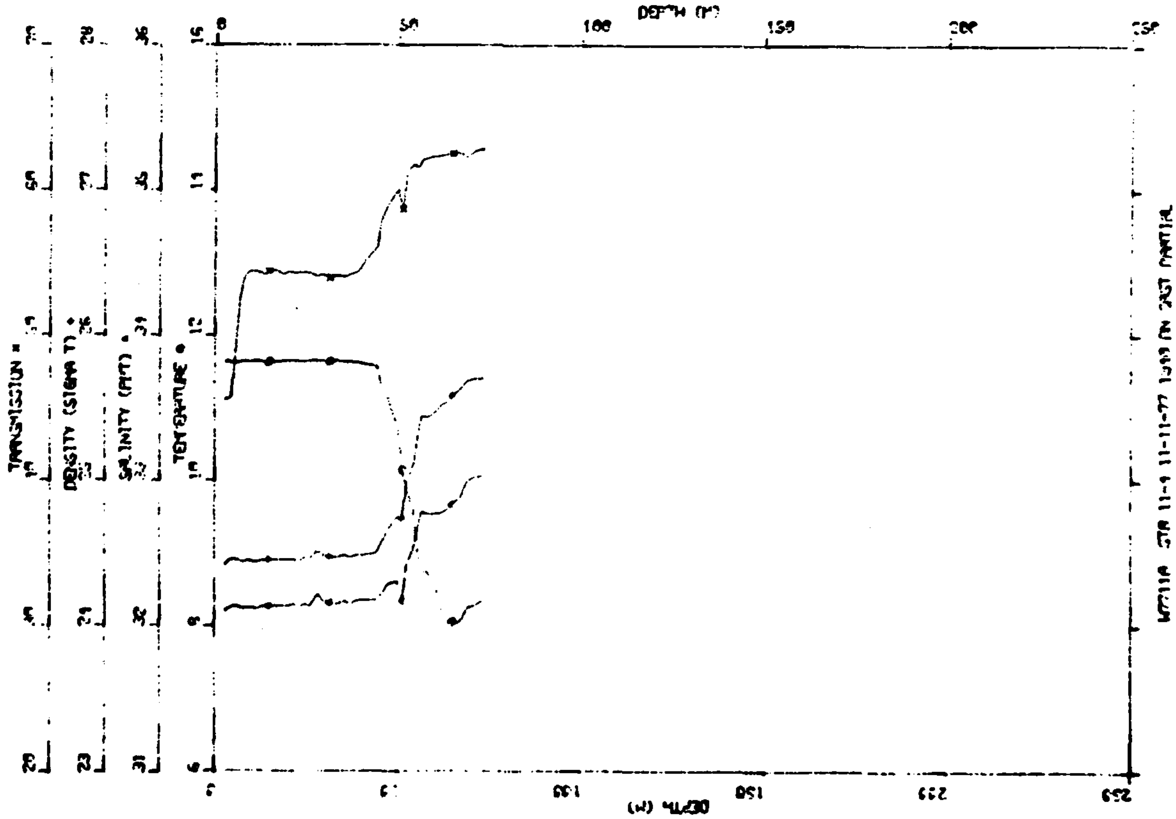

W7711A ANCHOR STA. 11-2 11-11-77 0215 UP CAST
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●


W7711A ANCHOR STA. 11-2 11-11-77 0215 DN CAST
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●

W7711A STA 11-4 11-11-77 1940 DN CAST

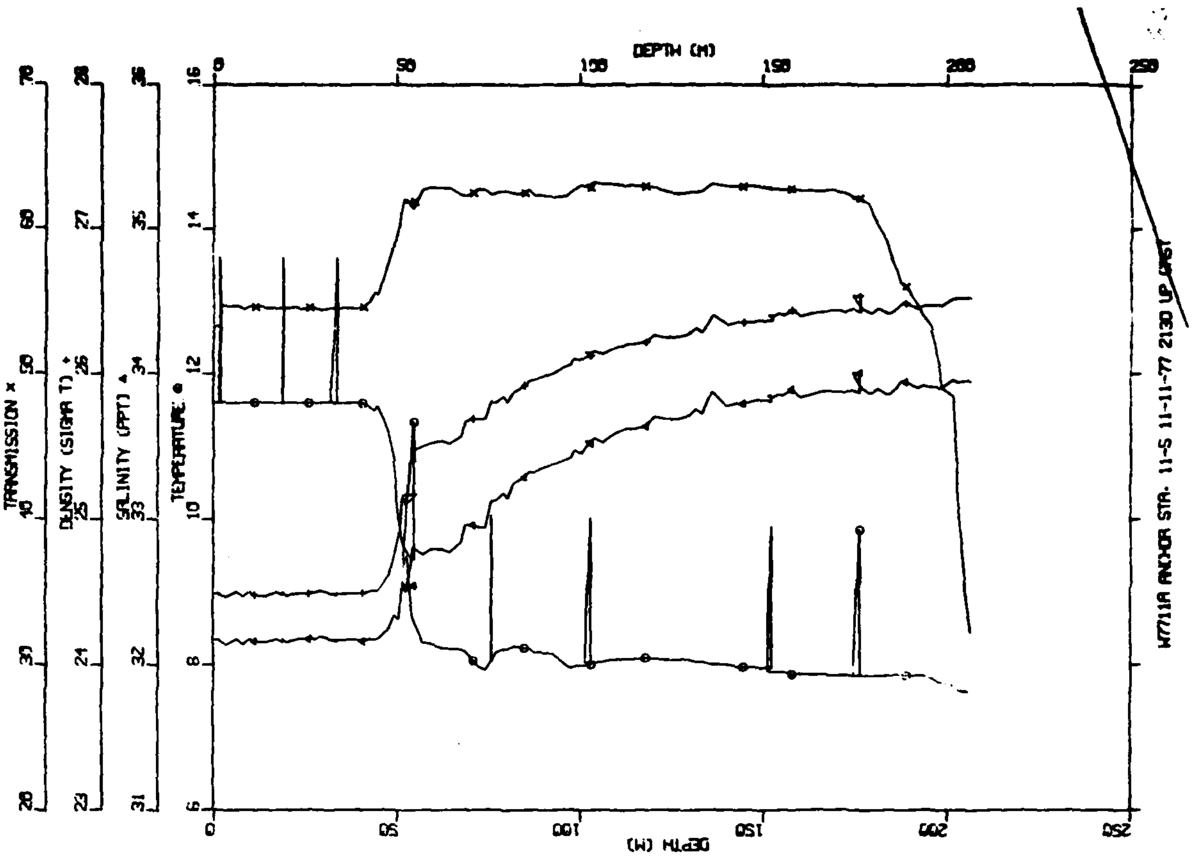
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.64	32.14	24.46	48.62
10.0	11.65	32.12	24.44	54.39
15.0	11.64	32.14	24.46	54.42
20.0	11.65	32.14	24.46	54.32
25.0	11.65	32.15	24.47	54.30
30.0	11.65	32.18	24.49	54.12
35.0	11.64	32.16	24.48	54.10
40.0	11.62	32.18	24.49	54.95
45.0	11.38	32.22	24.57	57.76
50.0	10.61	32.27	24.75	59.55
60.0	8.51	32.78	25.47	62.33
70.0	8.26	33.01	25.70	62.58
80.0	9.02	33.37	25.94	64.83
90.0	8.94	33.41	25.99	61.96
100.0	8.75	33.47	26.05	57.71
77.6	7.56	33.95	26.53	23.67

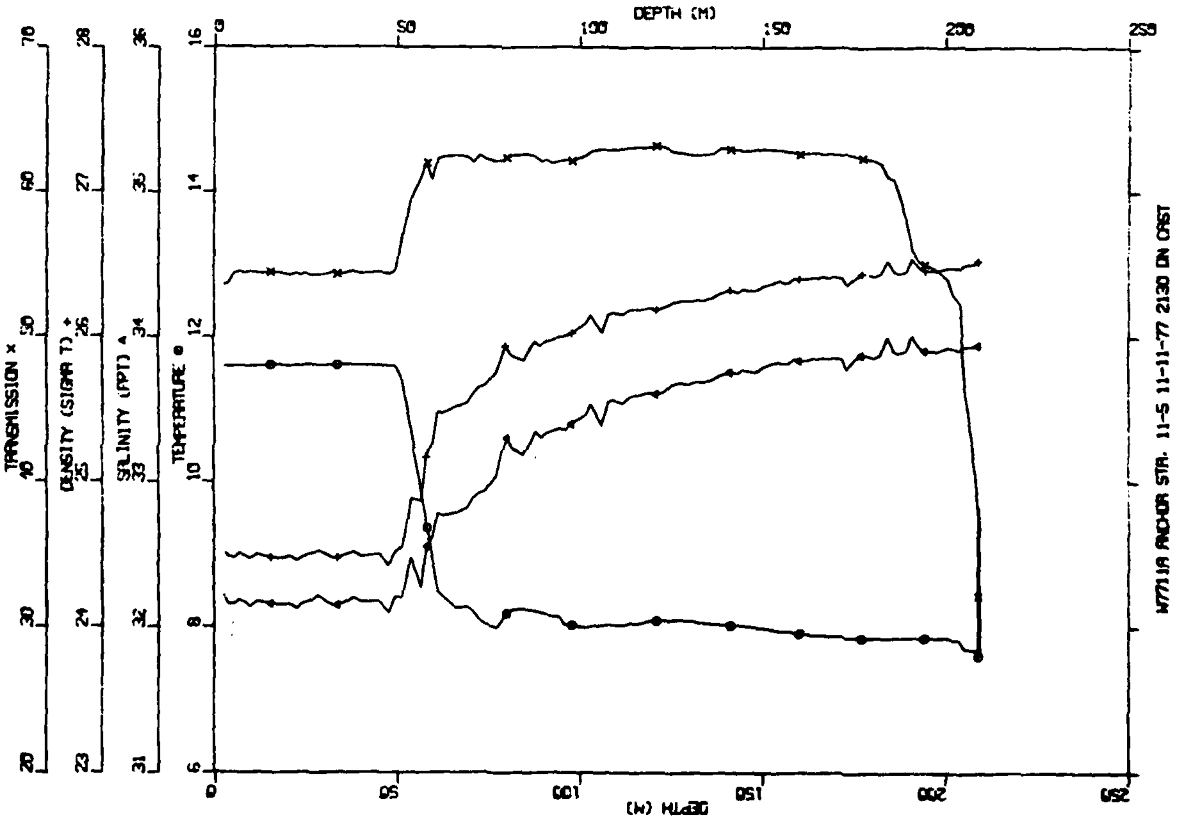

DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 11-5 11-11-77 2130 DN CAST

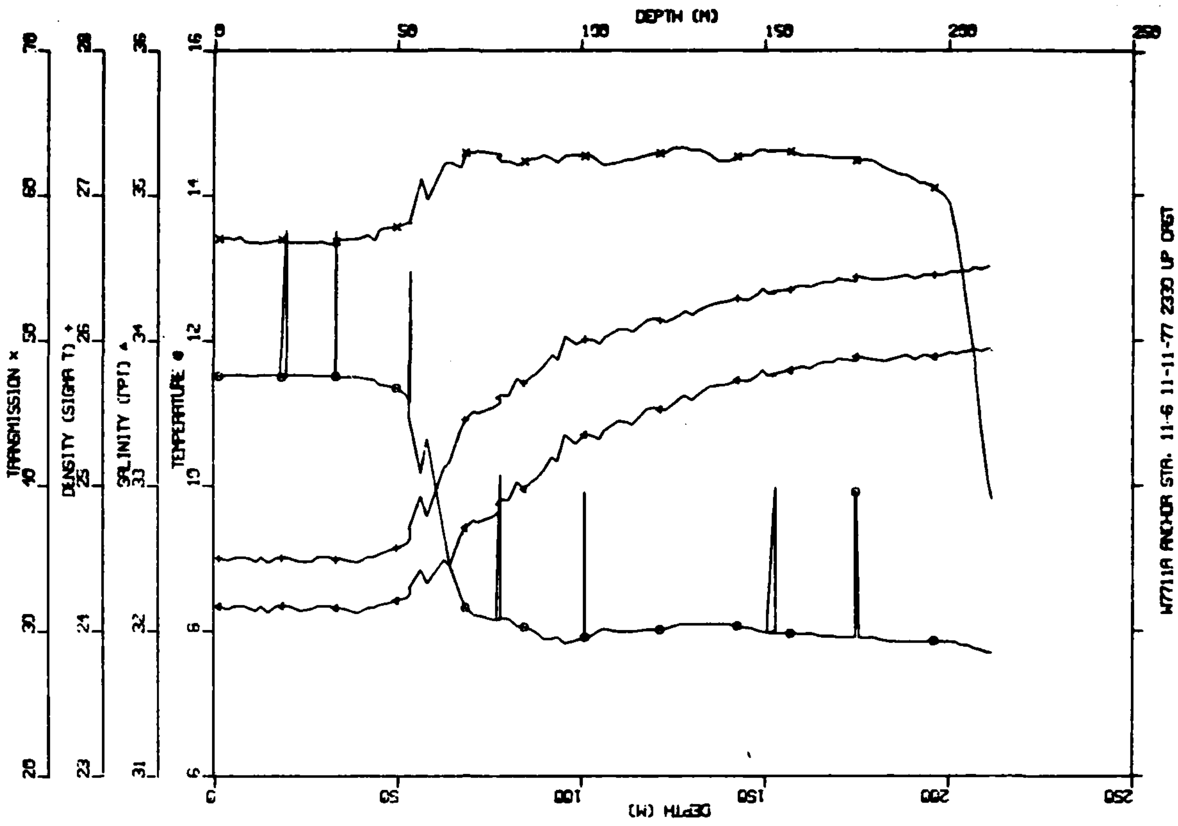
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.60	32.17	24.49	54.17
10.0	11.61	32.16	24.48	54.49
15.0	11.62	32.16	24.48	54.42
20.0	11.62	32.15	24.48	54.35
25.0	11.62	32.17	24.49	54.31
30.0	11.62	32.19	24.51	54.33
35.0	11.62	32.17	24.50	54.39
40.0	11.62	32.19	24.50	54.43
45.0	11.61	32.16	24.48	54.40
50.0	11.48	32.21	24.54	55.61
60.0	8.86	32.68	25.35	61.70
70.0	8.24	32.87	25.59	62.34
80.0	8.17	33.23	25.88	62.40
90.0	8.20	33.34	25.97	62.22
100.0	8.02	33.45	26.08	62.43
110.0	8.04	33.56	26.17	63.01
120.0	8.09	33.62	26.20	63.17
130.0	8.09	33.69	26.25	62.64
140.0	8.04	33.75	26.31	62.97
150.0	7.99	33.80	26.35	63.00
160.0	7.92	33.84	26.40	62.72
170.0	7.88	33.86	26.42	62.66
180.0	7.86	33.87	26.43	62.22
190.0	7.86	33.95	26.49	57.17
200.0	7.85	33.92	26.48	54.01
209.0	8.13	33.95	26.53	33.26


W7711A ANCHOR STA. 11-5 11-11-77 2130 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●

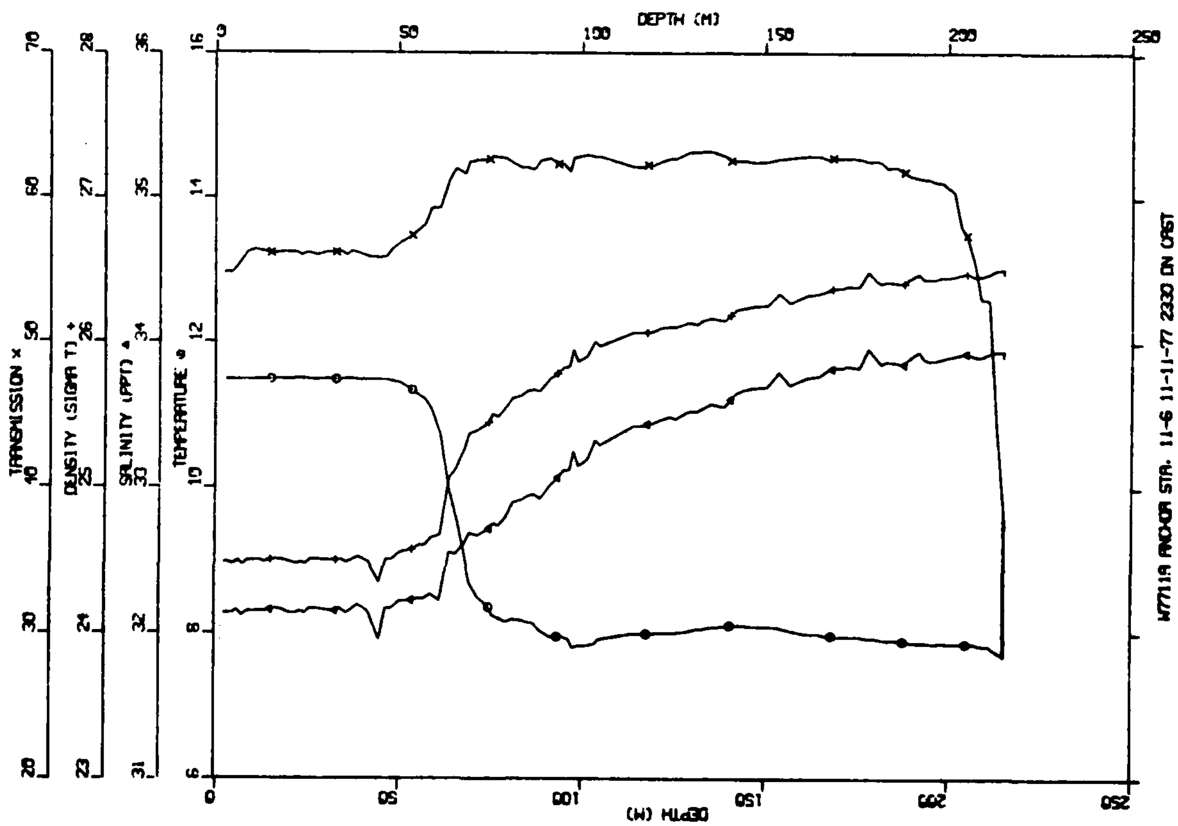

W7711A ANCHOR STA. 11-5 11-11-77 2130 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●

W7711A STA 11-6 11-11-77 2330 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.49	32.15	24.49	53.86
10.0	11.49	32.15	24.50	56.24
15.0	11.49	32.16	24.50	56.19
20.0	11.49	32.15	24.49	56.22
25.0	11.50	32.15	24.49	56.11
30.0	11.50	32.16	24.50	56.18
35.0	11.50	32.16	24.50	56.18
40.0	11.49	32.16	24.50	56.07
45.0	11.49	32.07	24.43	55.88
50.0	11.45	32.21	24.55	56.81
60.0	10.88	32.28	24.70	59.35
70.0	8.70	32.68	25.37	62.39
80.0	8.18	32.84	25.58	62.54
90.0	8.01	32.99	25.72	62.53
100.0	7.83	33.20	25.91	62.89
110.0	7.95	33.37	26.03	62.49
120.0	7.99	33.46	26.09	62.39
130.0	8.04	33.53	26.13	63.08
140.0	8.10	33.60	26.19	62.75
150.0	8.09	33.72	26.28	62.54
160.0	8.01	33.75	26.32	62.84
170.0	7.96	33.83	26.38	62.79
180.0	7.93	33.90	26.44	62.56
190.0	7.88	33.90	26.44	61.58
200.0	7.86	33.90	26.45	60.77
210.0	7.83	33.92	26.47	52.71
215.2	8.18	33.91	26.49	36.03



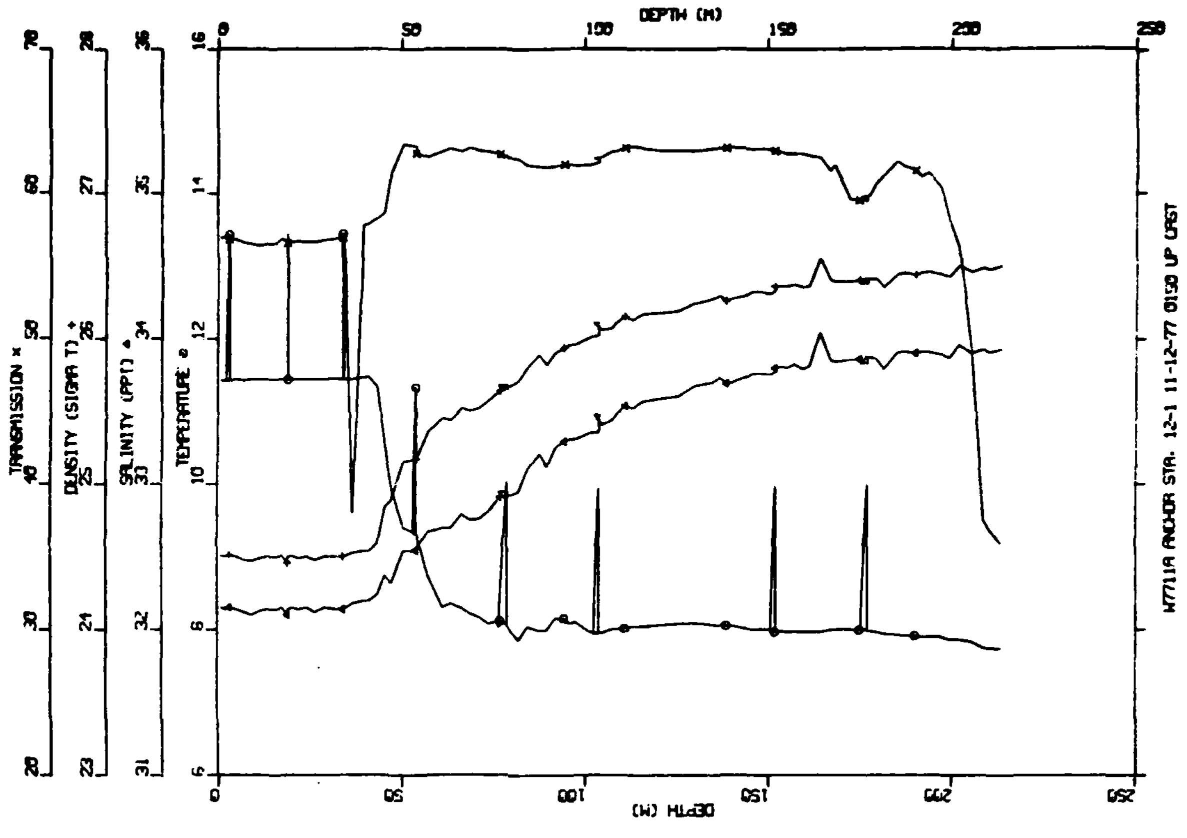
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●
W7711A ANCHOR STA. 11-6 11-11-77 2330 UP CAST

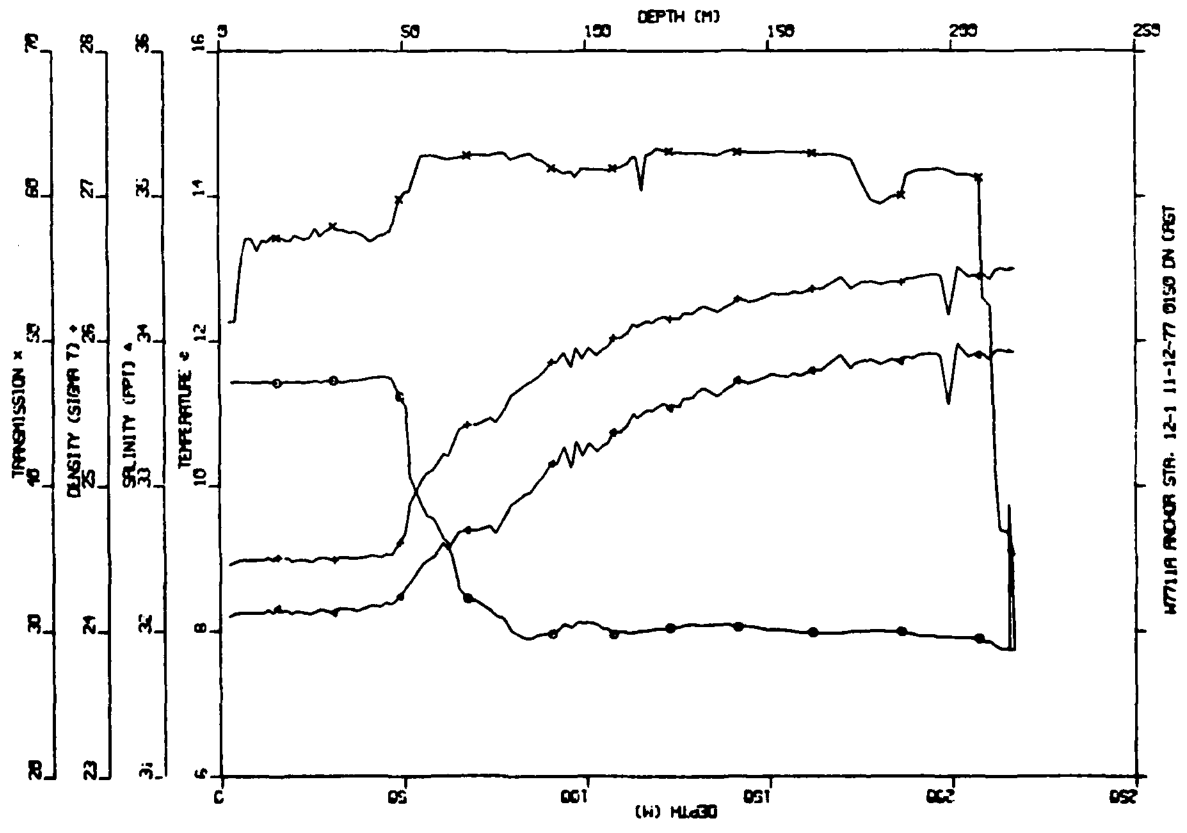


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ●
W7711A ANCHOR STA. 11-6 11-11-77 2330 DN CAST

W77[illegible]1A STA 12-1 11-12-77 0150 DN CAST

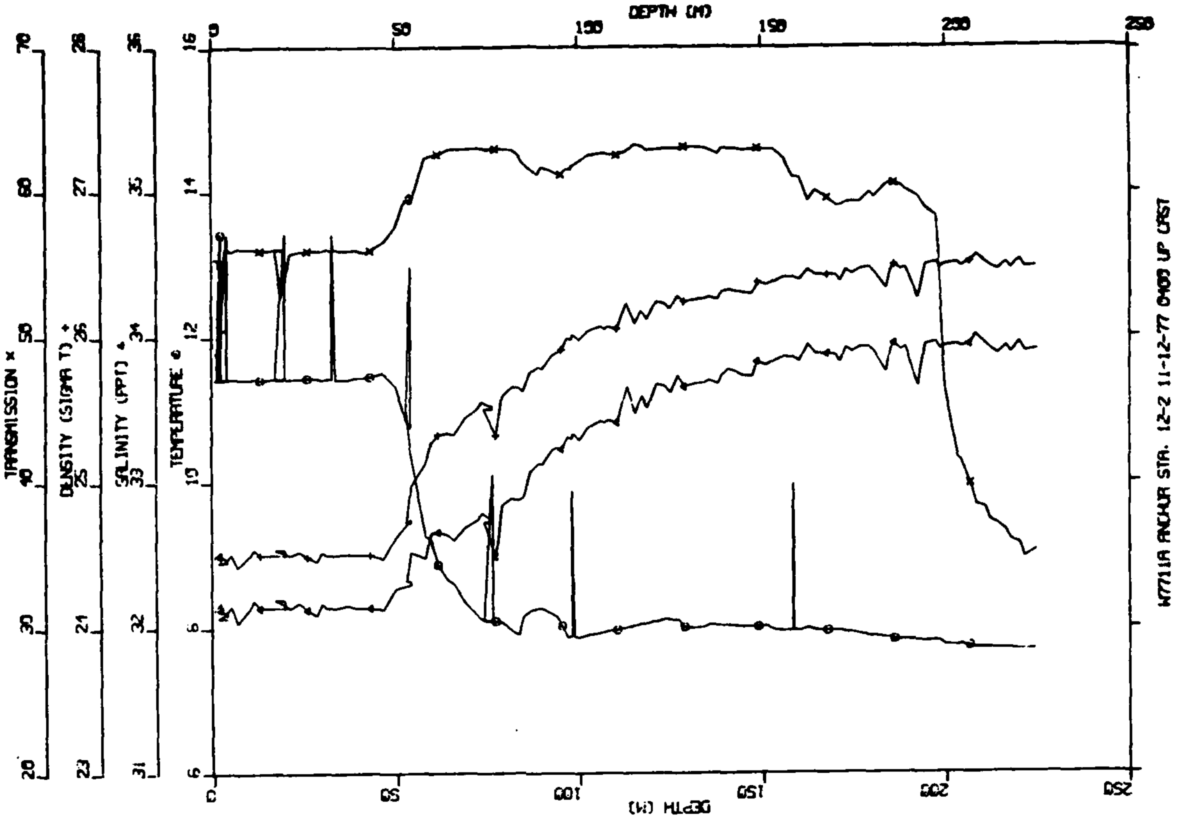
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.44	32.13	24.49	54.11
10.0	11.43	32.13	24.49	56.63
15.0	11.43	32.15	24.50	57.15
20.0	11.44	32.13	24.49	57.07
25.0	11.44	32.13	24.49	57.33
30.0	11.45	32.14	24.50	57.68
35.0	11.45	32.15	24.50	57.57
40.0	11.48	32.17	24.52	57.18
45.0	11.50	32.19	24.53	57.42
50.0	11.02	32.28	24.68	59.91
60.0	9.36	32.57	25.18	62.66
70.0	8.39	32.70	25.43	62.84
80.0	8.01	32.88	25.63	62.79
90.0	7.98	33.12	25.83	62.16
100.0	8.11	33.26	25.92	61.82
110.0	7.98	33.39	26.04	62.10
120.0	8.03	33.55	26.15	63.16
130.0	8.09	33.64	26.21	62.98
140.0	8.07	33.70	26.26	63.08
150.0	8.03	33.76	26.32	63.07
160.0	7.98	33.78	26.34	63.00
170.0	7.98	33.86	26.41	62.71
180.0	8.00	33.86	26.40	59.71
190.0	7.95	33.90	26.44	61.70
200.0	7.92	33.79	26.36	61.64
210.0	7.85	33.90	26.45	50.71
215.5	8.24	33.94	26.50	35.46

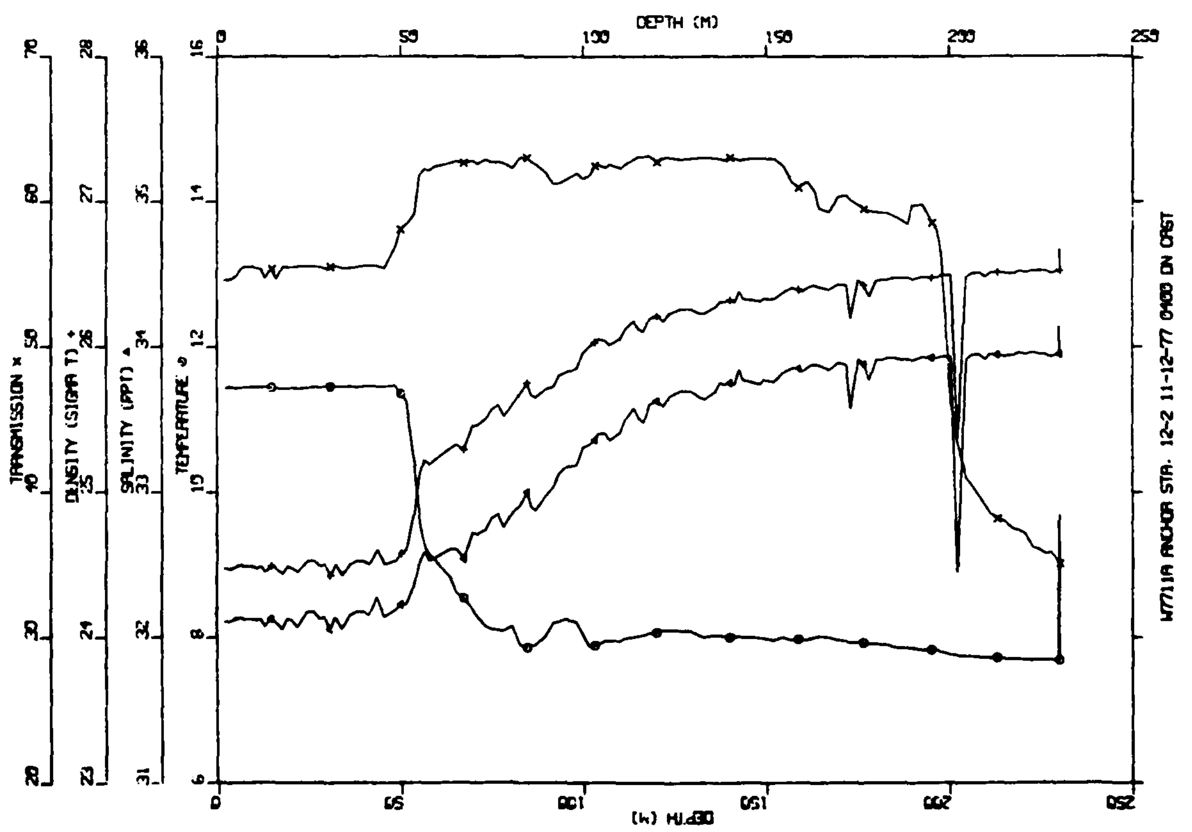

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A ANCHOR STA. 12-1 11-12-77 0150 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT)
TEMPERATURE
W7711A ANCHOR STA. 12-1 11-12-77 0150 DN CAST

W7711A STA 12-2 11-12-77 0400 DN CAST

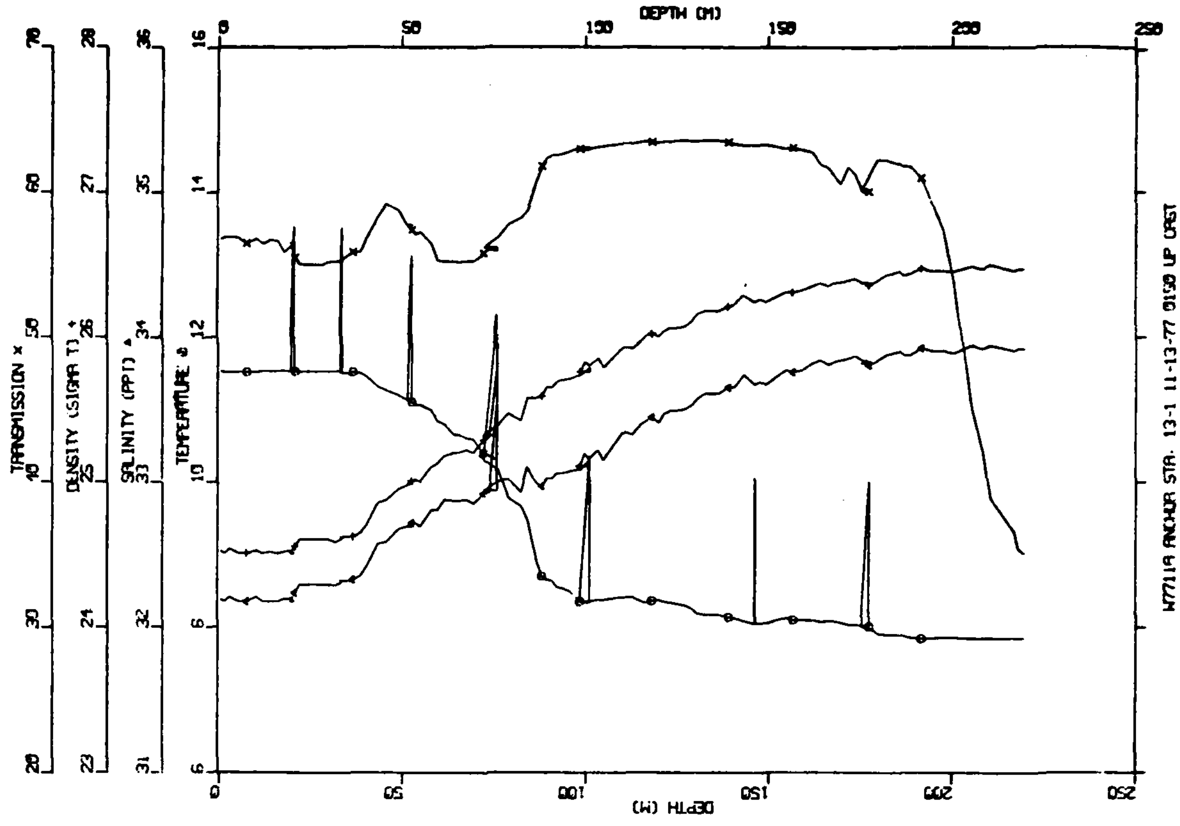
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.44	32.13	24.49	54.92
10.0	11.45	32.13	24.49	55.46
15.0	11.44	32.11	24.48	55.04
20.0	11.44	32.11	24.48	55.48
25.0	11.44	32.16	24.51	55.54
30.0	11.45	32.11	24.47	55.44
35.0	11.45	32.12	24.48	55.44
40.0	11.45	32.17	24.52	55.53
45.0	11.46	32.20	24.54	55.74
50.0	11.33	32.23	24.58	57.95
60.0	9.02	32.56	25.24	62.43
70.0	8.36	32.69	25.43	62.71
80.0	8.08	32.84	25.59	62.57
90.0	8.06	32.98	25.71	61.86
100.0	8.05	33.29	25.94	61.76
110.0	7.96	33.42	26.06	62.43
120.0	8.07	33.61	26.20	62.90
130.0	8.07	33.68	26.25	62.98
140.0	8.01	33.75	26.31	62.95
150.0	7.99	33.77	26.33	62.94
160.0	7.97	33.84	26.39	61.14
170.0	7.97	33.86	26.41	60.11
180.0	7.92	33.88	26.43	59.29
190.0	7.85	33.91	26.47	59.41
200.0	7.78	33.60	26.23	48.60
210.0	7.72	33.93	26.50	39.06
220.0	7.69	33.96	26.52	37.11
230.0	8.18	33.95	26.52	35.30
229.9	8.19	34.09	26.63	34.96

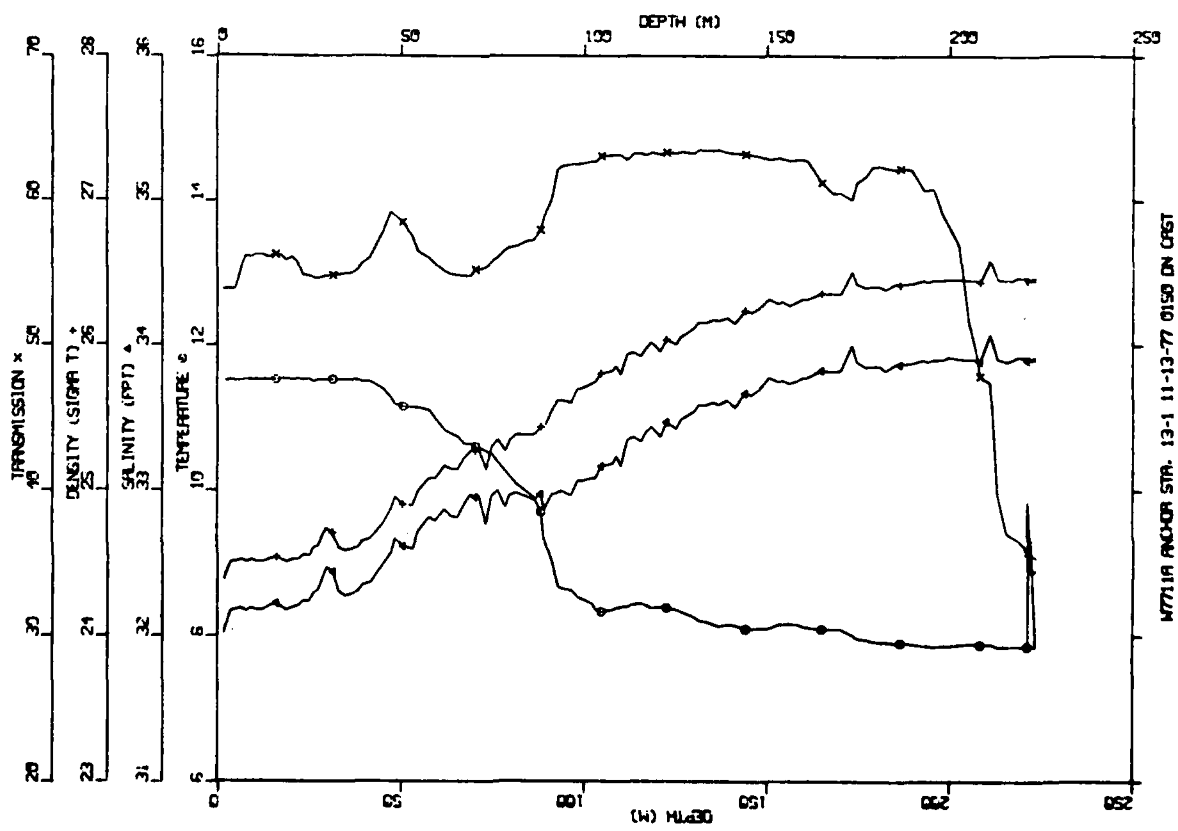

W7711A ANCHOR STA. 12-2 11-12-77 0400 UP CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙


W7711A ANCHOR STA. 12-2 11-12-77 0400 DN CAST
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊙

W7711A STA 13-1 11-13-77 0150 DN CAST

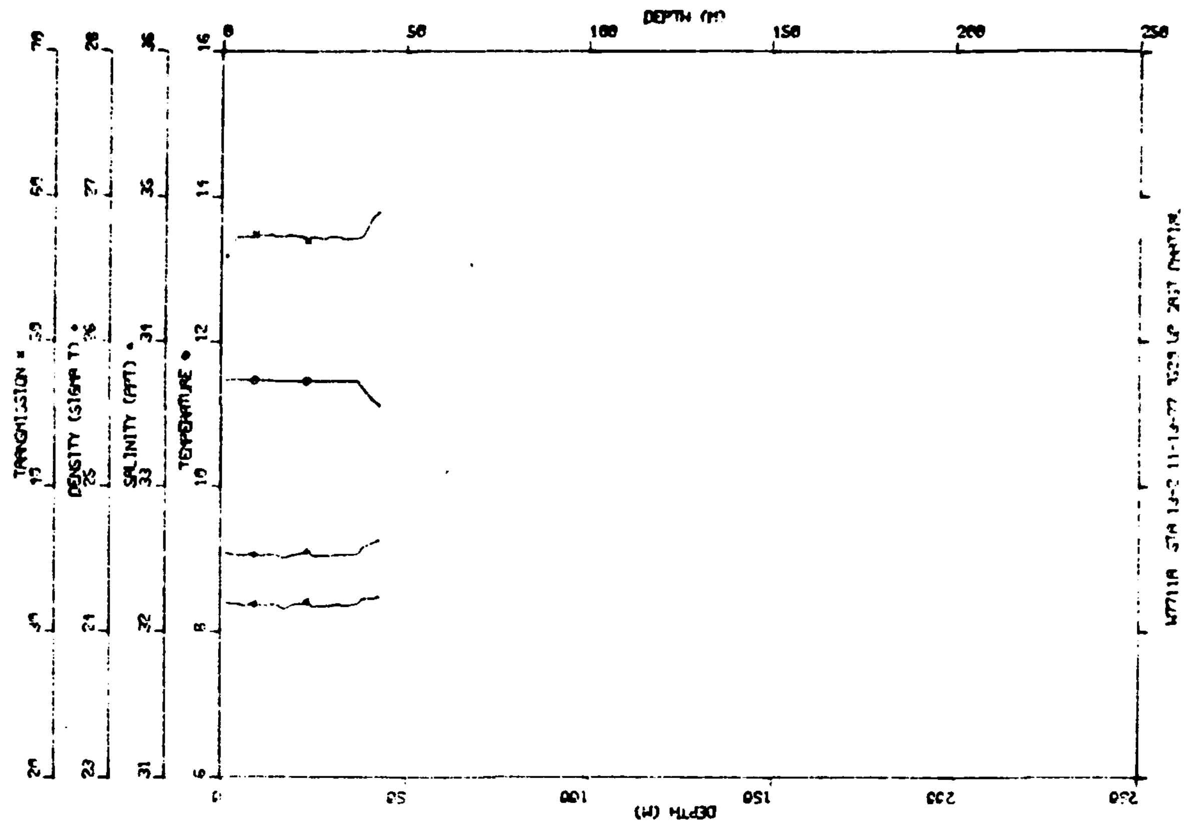
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.52	32.18	24.51	51.81
10.0	11.53	32.18	24.51	56.22
15.0	11.53	32.21	24.53	56.21
20.0	11.54	32.20	24.53	55.98
25.0	11.53	32.26	24.57	54.84
30.0	11.53	32.43	24.70	54.81
35.0	11.53	32.29	24.60	55.01
40.0	11.50	32.37	24.66	55.88
45.0	11.40	32.49	24.78	57.75
50.0	11.18	32.63	24.92	58.52
60.0	10.96	32.84	25.12	55.54
70.0	10.62	32.97	25.28	55.16
80.0	10.18	32.96	25.35	56.79
90.0	9.19	32.94	25.51	59.57
100.0	8.49	33.08	25.73	62.64
110.0	8.39	33.23	25.85	63.07
120.0	8.39	33.41	26.00	63.27
130.0	8.26	33.55	26.12	63.36
140.0	8.14	33.60	26.18	63.33
150.0	8.11	33.74	26.29	62.97
160.0	8.13	33.78	26.32	62.79
170.0	8.08	33.86	26.39	60.50
180.0	7.93	33.86	26.41	62.28
190.0	7.89	33.88	26.43	61.75
200.0	7.87	33.91	26.46	58.11
210.0	7.89	33.97	26.50	46.75
220.0	7.85	33.92	26.47	36.05
223.3	7.85	33.92	26.47	35.50

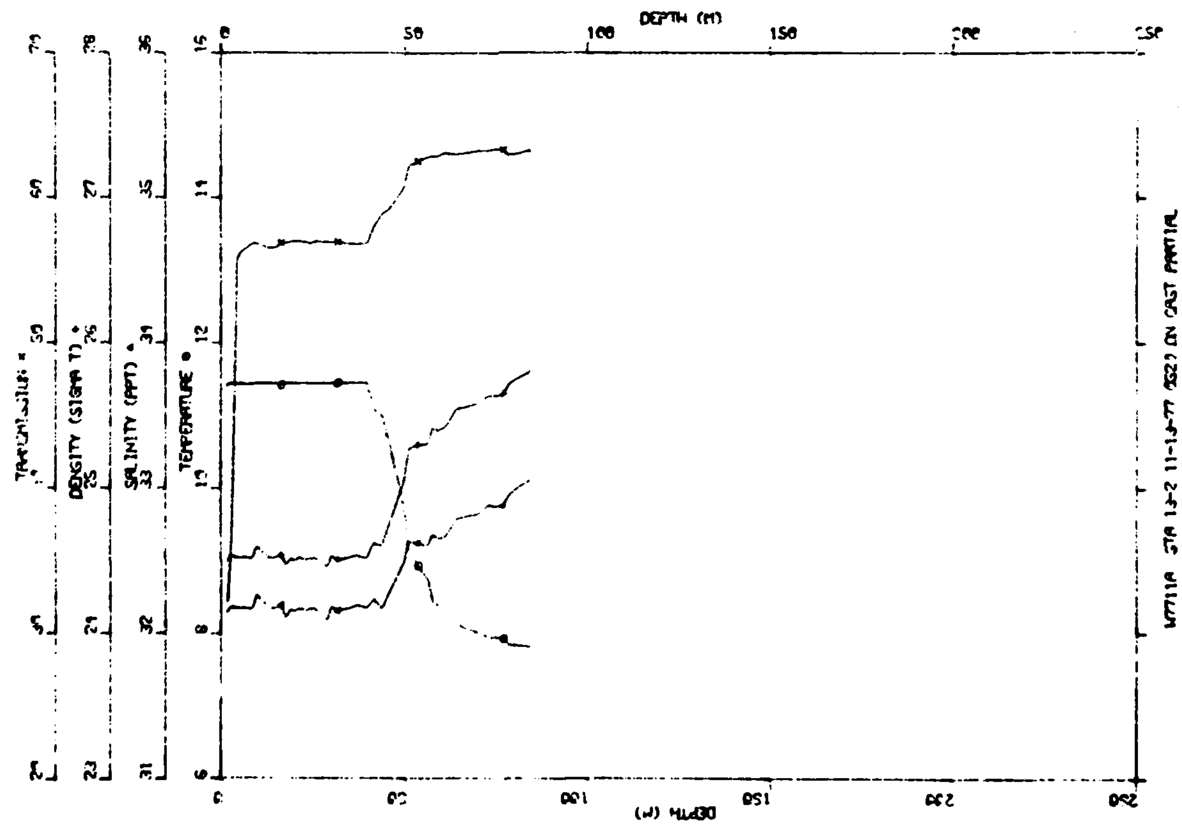

W7711A ANCHOR STA. 13-1 11-13-77 0150 UP CAST
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊕
DEPTH (M)


W7711A ANCHOR STA. 13-1 11-13-77 0150 DN CAST
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) ▲
TEMPERATURE ⊕
DEPTH (M)

W7711A STA 13-2 11-13-77 0520 DN CAST

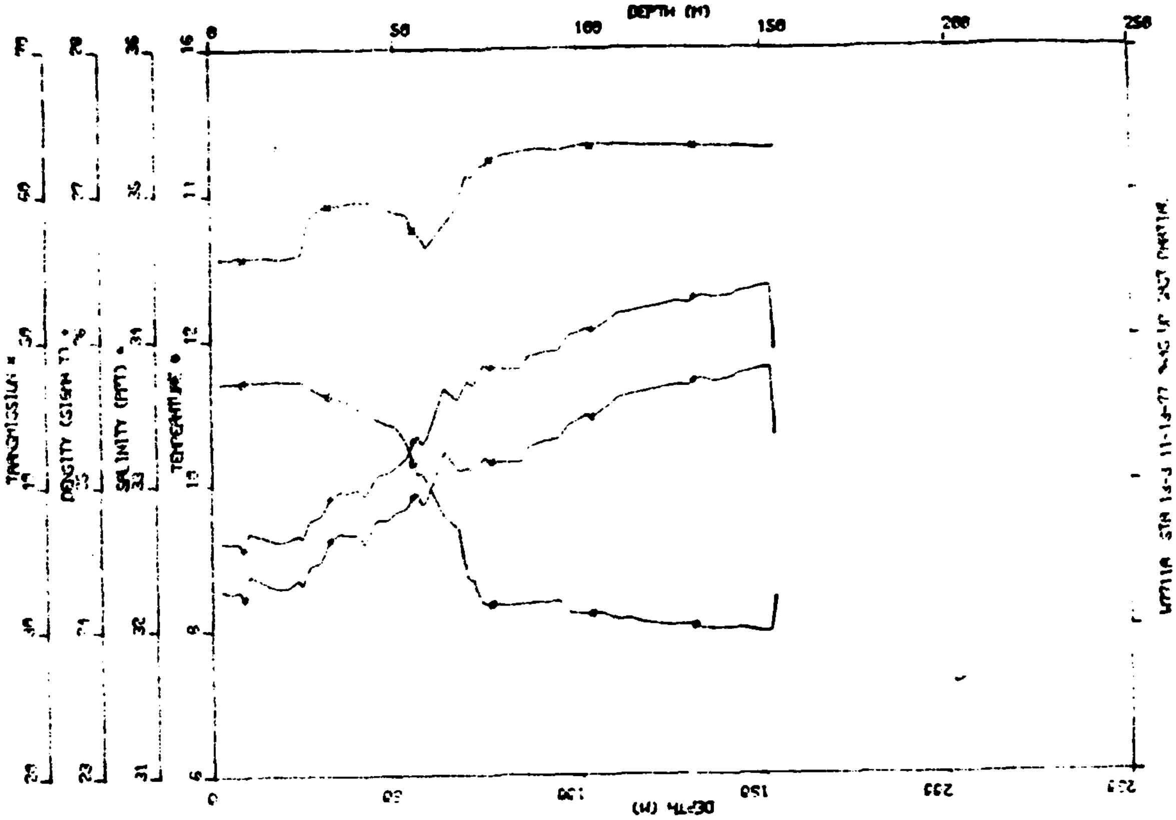
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.45	32.18	24.53	55.16
10.0	11.45	32.22	24.56	56.79
15.0	11.45	32.18	24.53	56.66
20.0	11.45	32.16	24.51	57.01
25.0	11.45	32.16	24.51	56.97
30.0	11.45	32.16	24.51	56.99
35.0	11.46	32.18	24.53	56.88
40.0	11.31	32.20	24.56	57.36
45.0	10.65	32.29	24.75	59.28
50.0	9.64	32.52	25.10	61.08
60.0	8.34	32.69	25.43	63.00
70.0	8.02	32.84	25.60	63.22
80.0	7.85	32.99	25.74	63.08
84.1	7.83	33.05	25.79	63.20

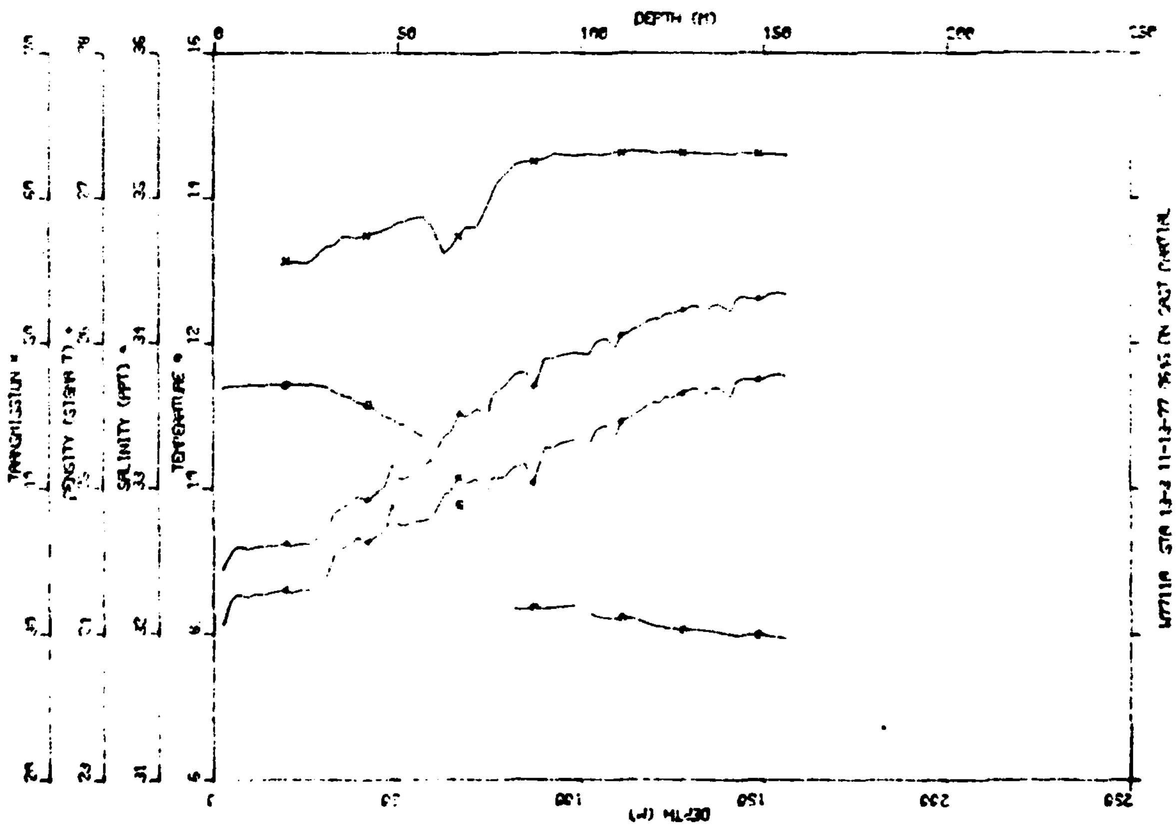

DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 13-3 11-13-77 0645 DN CAST

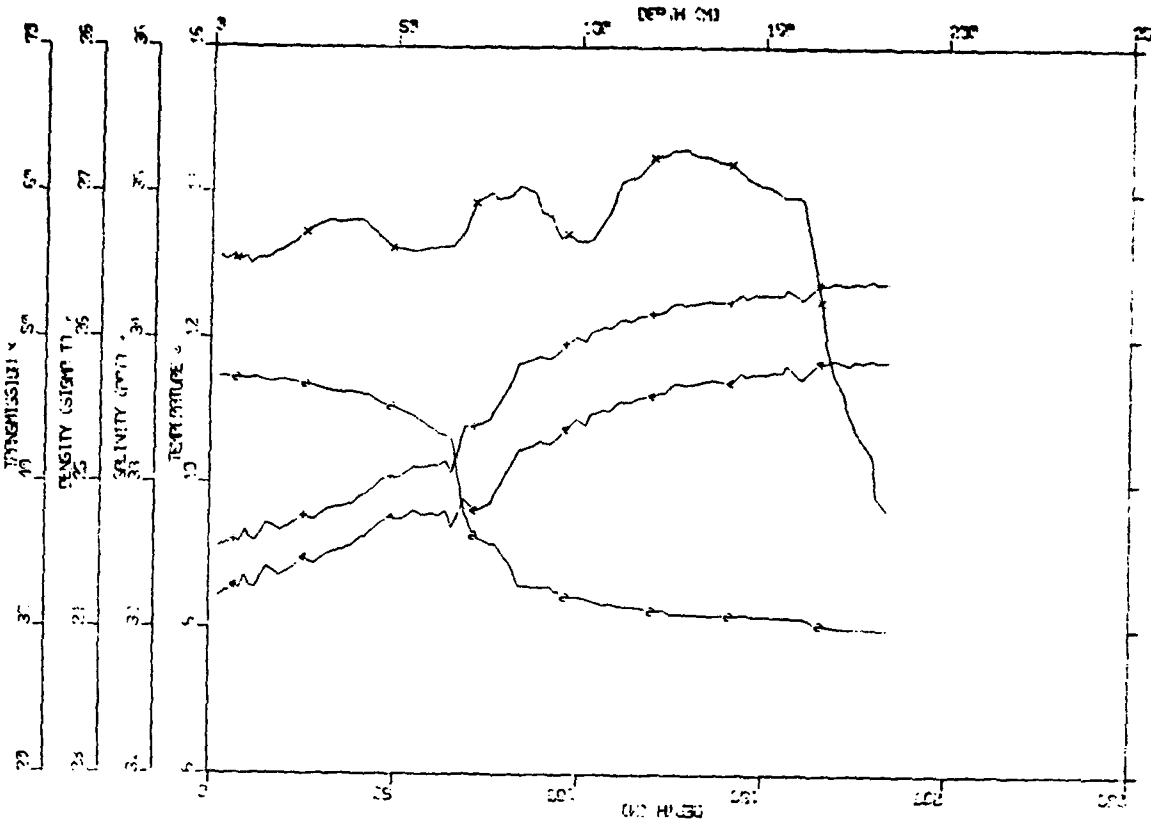
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.42	32.22	24.57	52.18
10.0	11.44	32.27	24.60	55.68
15.0	11.44	32.29	24.62	55.59
20.0	11.44	32.30	24.62	55.65
25.0	11.43	32.32	24.64	55.79
30.0	11.40	32.41	24.71	56.39
35.0	11.30	32.60	24.88	57.24
40.0	11.18	32.66	24.95	57.45
45.0	11.07	32.73	25.02	57.71
50.0	10.92	32.79	25.10	58.29
60.0	10.36	32.82	25.22	57.62
70.0	9.57	33.06	25.53	58.16
80.0	8.50	33.11	25.74	61.85
90.0	8.38	33.23	25.85	62.81
100.0	8.35	33.33	25.94	63.03
110.0	8.23	33.41	26.02	63.18
120.0	8.14	33.59	26.17	63.20
130.0	8.07	33.68	26.25	63.15
140.0	8.02	33.68	26.26	63.11
150.0	8.00	33.77	26.33	63.08
160.0	7.95	34.53	26.93	63.26
170.0	8.10	35.88	27.96	64.54
180.0	8.63	36.79	28.59	65.78
190.0	9.30	37.39	28.95	67.29
157.6	10.12	39.41	30.39	69.96

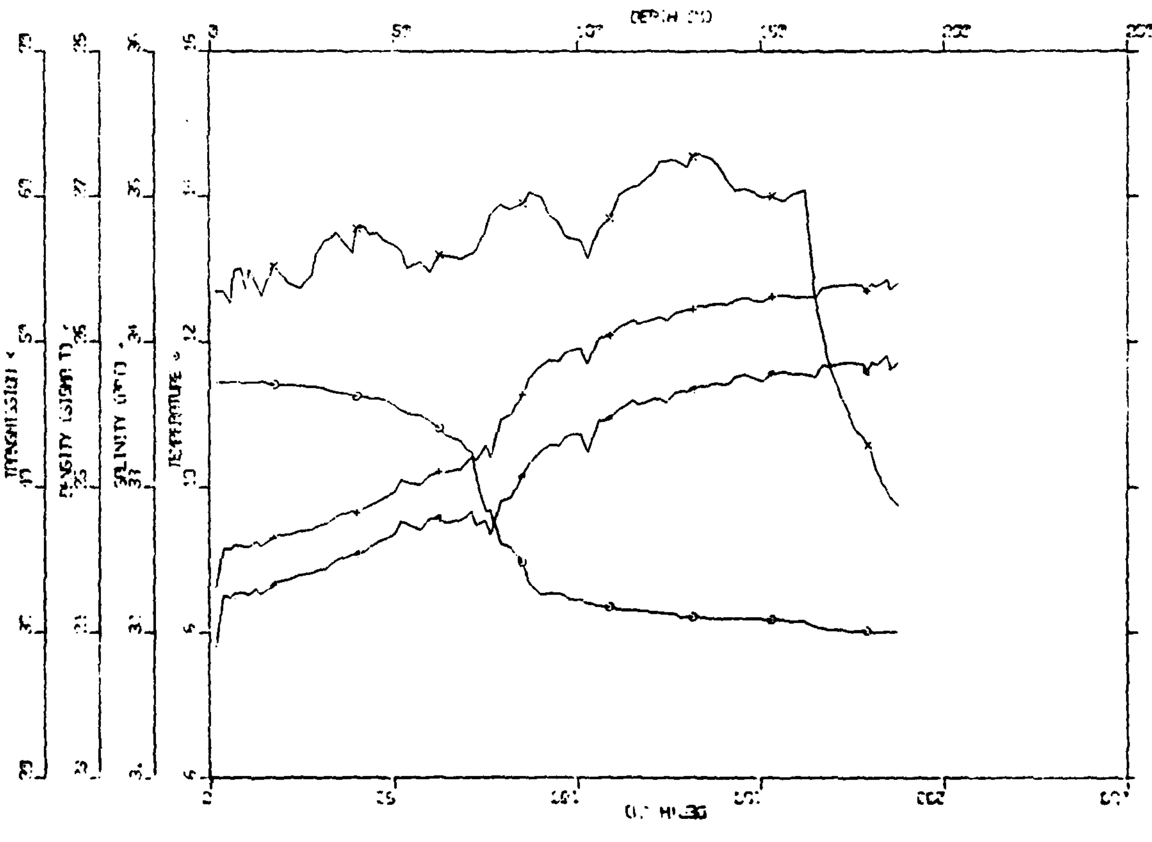

DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE

W7711A STA 13-4 11-13-77 0800 DN CAST

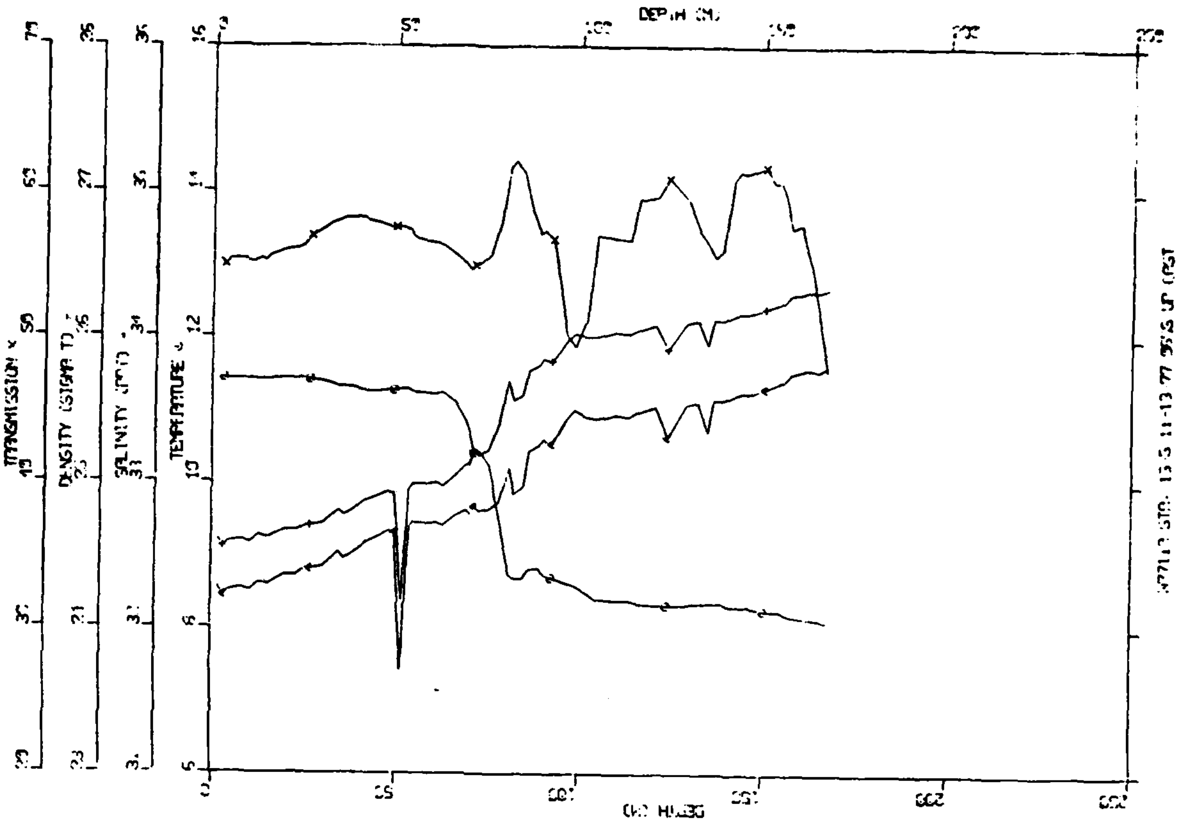
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.45	32.23	24.57	53.48
10.0	11.45	32.27	24.60	54.43
15.0	11.44	32.30	24.63	54.16
20.0	11.42	32.36	24.68	54.53
25.0	11.40	32.40	24.70	54.17
30.0	11.37	32.44	24.74	56.33
35.0	11.32	32.51	24.81	57.07
40.0	11.27	32.55	24.84	57.51
45.0	11.23	32.62	24.90	57.43
50.0	11.15	32.70	24.99	56.70
60.0	10.91	32.77	25.08	55.35
70.0	10.52	32.81	25.18	55.96
80.0	9.27	32.89	25.45	59.23
90.0	8.57	33.25	25.83	59.68
100.0	8.45	33.35	25.93	56.84
110.0	8.34	33.51	26.08	59.24
120.0	8.29	33.60	26.16	61.52
130.0	8.22	33.67	26.22	62.29
140.0	8.19	33.72	26.27	61.49
150.0	8.18	33.75	26.29	60.09
160.0	8.15	33.78	26.31	59.55
170.0	8.04	33.85	26.39	47.51
180.0	8.01	33.84	26.38	42.39
187.6	8.00	33.85	26.39	38.92

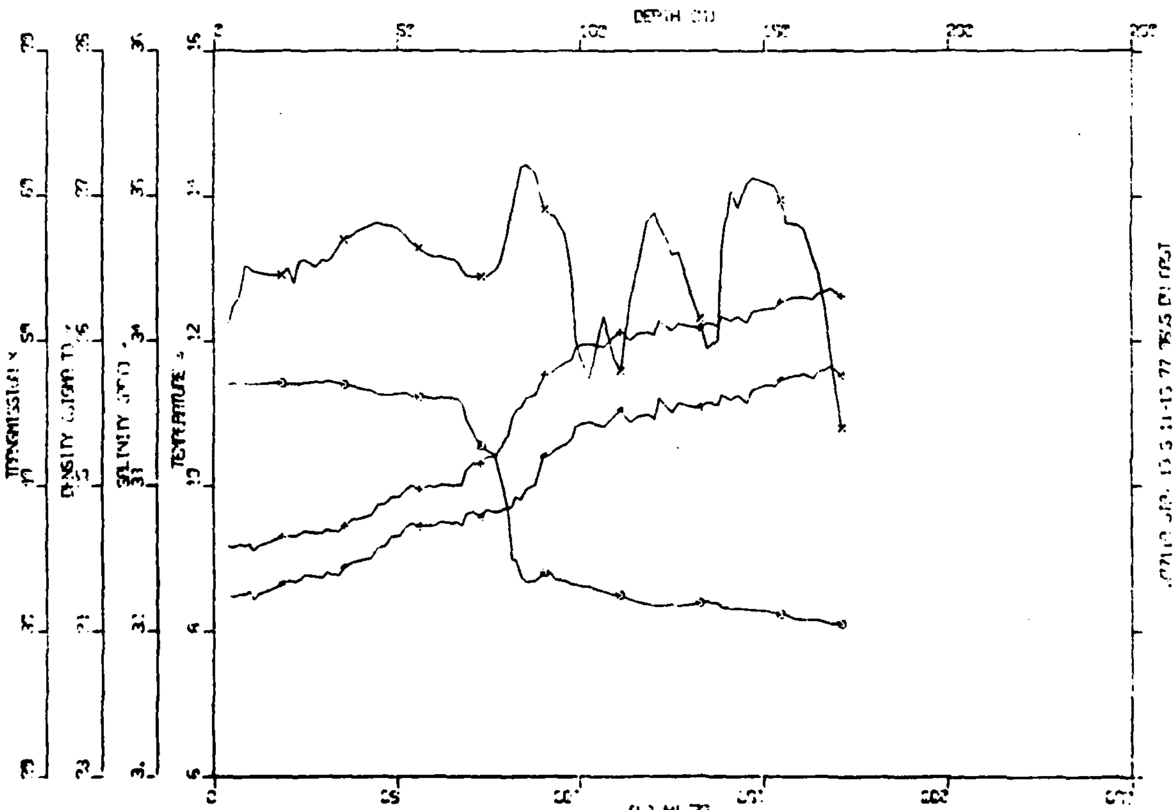




W7711A STA 13-5 11-13-77 0855 DN CAST

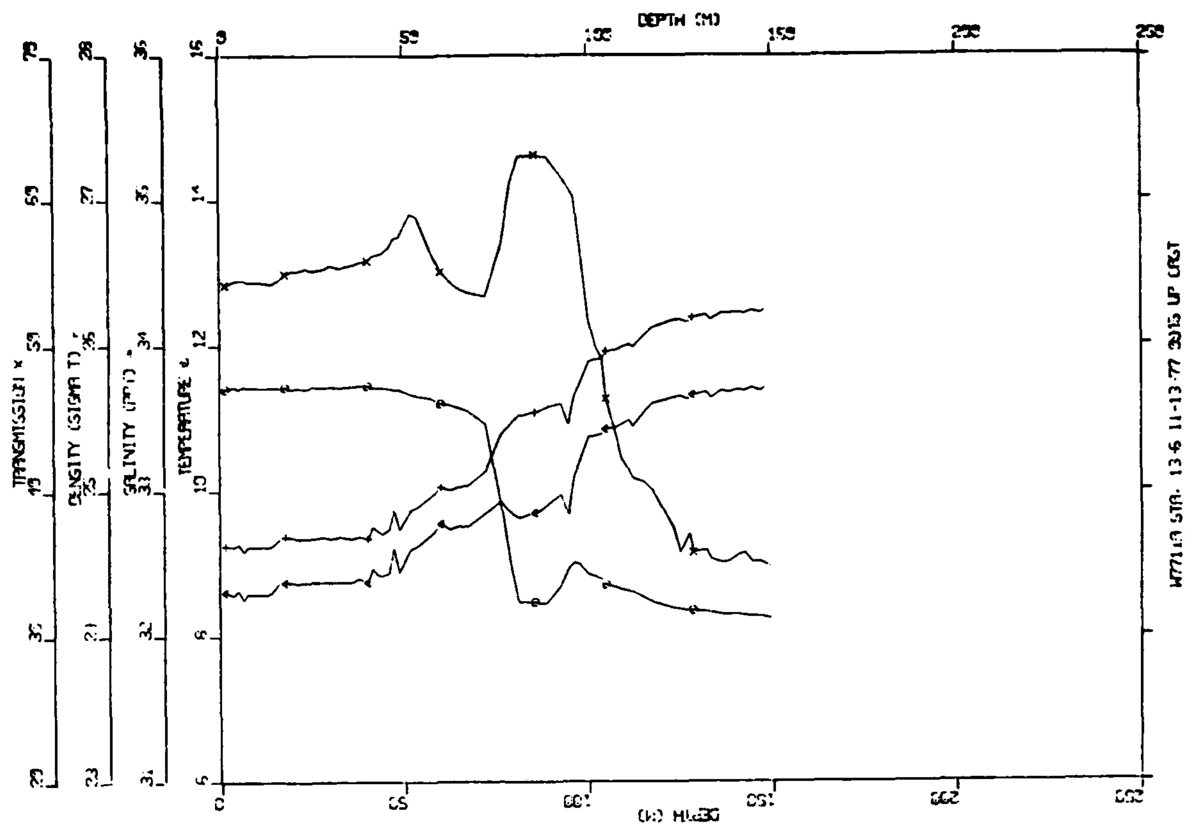
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.43	32.25	24.59	52.24
10.0	11.42	32.26	24.59	55.05
15.0	11.43	32.29	24.62	54.68
20.0	11.42	32.34	24.66	54.71
25.0	11.43	32.38	24.68	55.48
30.0	11.44	32.39	24.69	55.54
35.0	11.41	32.43	24.72	56.81
40.0	11.35	32.50	24.79	57.71
45.0	11.28	32.58	24.87	58.10
50.0	11.27	32.66	24.93	57.75
60.0	11.22	32.74	25.00	55.91
70.0	10.81	32.80	25.13	54.59
80.0	9.64	32.85	25.36	57.32
90.0	8.79	33.16	25.74	59.70
100.0	8.64	33.43	25.97	48.81
110.0	8.51	33.48	26.03	49.32
120.0	8.36	33.50	26.07	58.43
130.0	8.37	33.55	26.10	53.69
140.0	8.33	33.61	26.16	57.49
150.0	8.28	33.68	26.22	60.99
160.0	8.17	33.76	26.30	57.81
170.0	8.10	33.79	26.34	46.03
169.7	8.10	33.77	26.32	44.57


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C

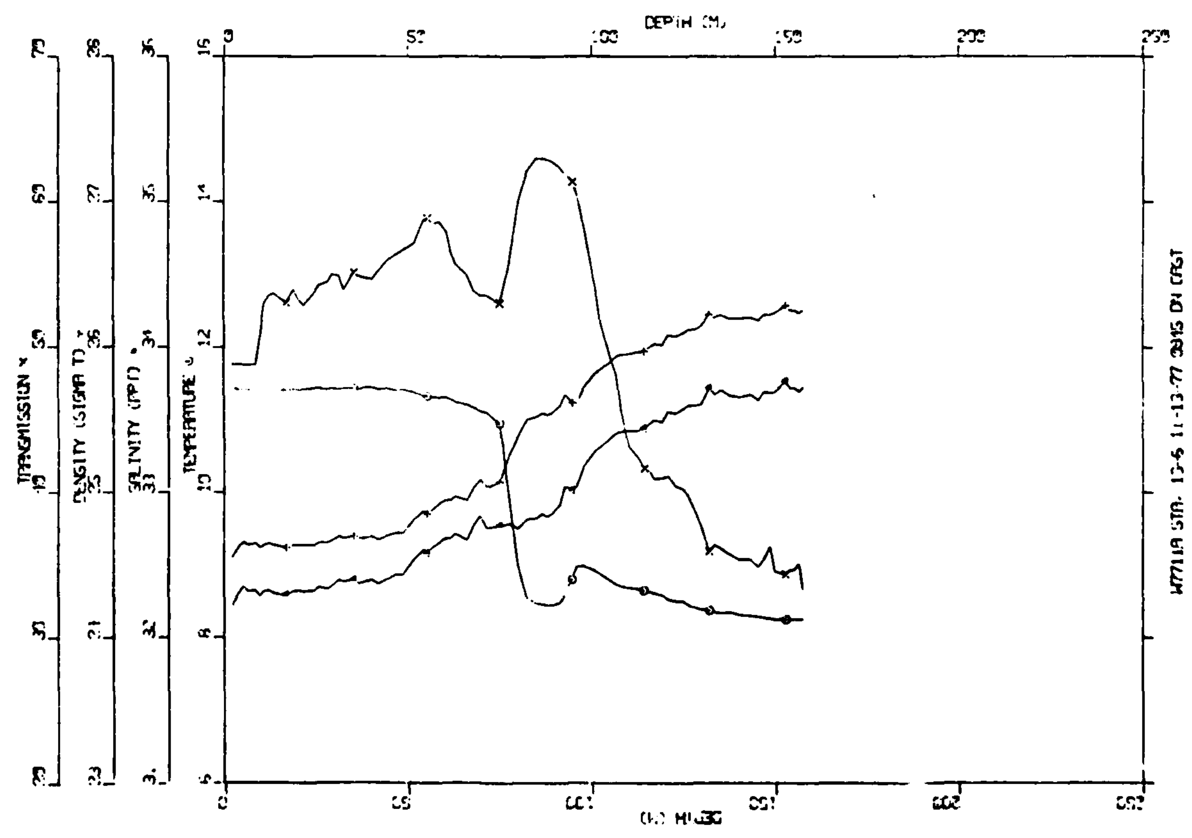

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C

W77[illegible]1A STA 13-6 11-13-77 0945 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.42	32.33	24.65	21.47
10.0	11.42	32.31	24.63	51.48
15.0	11.42	32.31	24.64	53.48
20.0	11.43	32.33	24.64	53.36
25.0	11.44	32.34	24.66	53.95
30.0	11.44	32.38	24.69	54.82
35.0	11.44	32.39	24.70	54.79
40.0	11.45	32.39	24.69	54.89
45.0	11.43	32.42	24.72	56.06
50.0	11.41	32.50	24.78	57.08
60.0	11.31	32.68	24.95	57.95
70.0	11.13	32.81	25.07	53.66
80.0	9.10	32.78	25.40	59.61
90.0	8.48	32.90	25.58	62.62
100.0	8.94	33.25	25.79	55.44
110.0	8.70	33.43	25.96	43.86
120.0	8.57	33.52	26.05	41.01
130.0	8.40	33.64	26.17	37.50
140.0	8.33	33.67	26.20	35.55
150.0	8.26	33.72	26.25	34.95
157.8	8.25	33.72	26.26	33.83



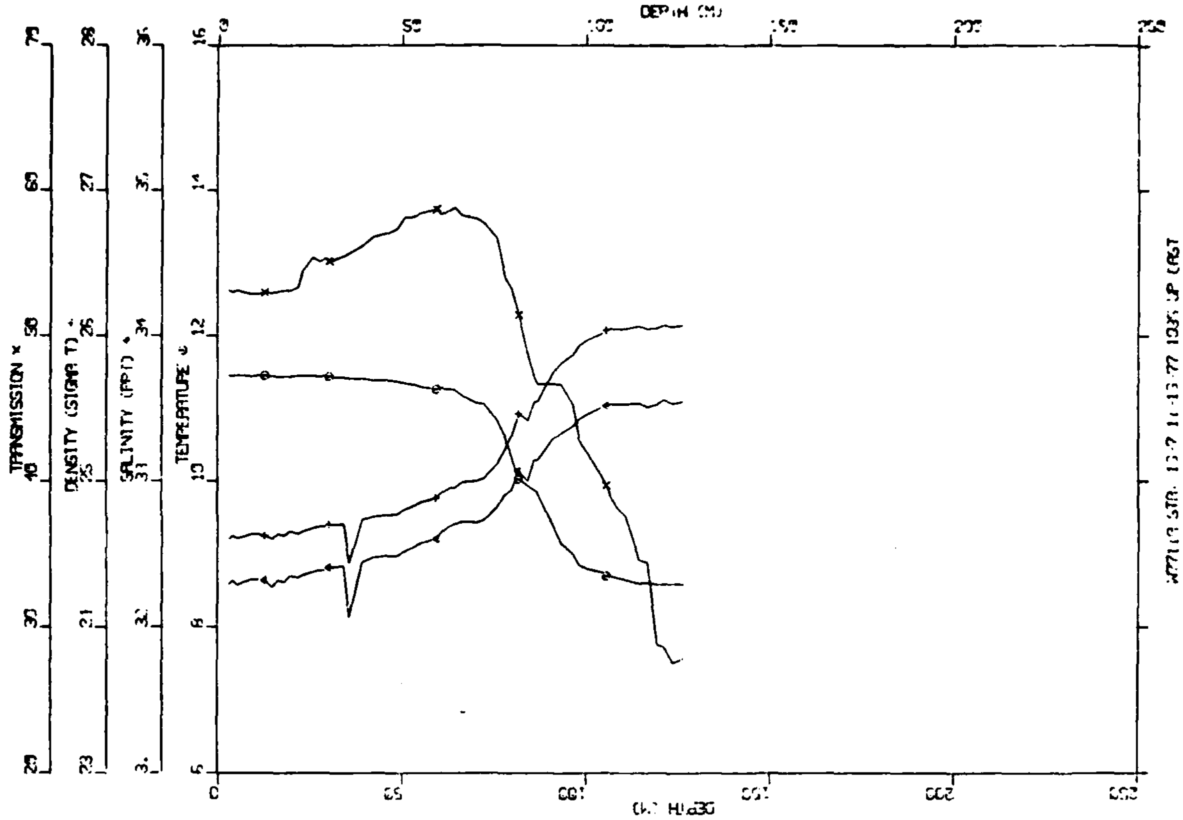
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W7719 STA. 13-6 11-13-77 3015 UP CAST



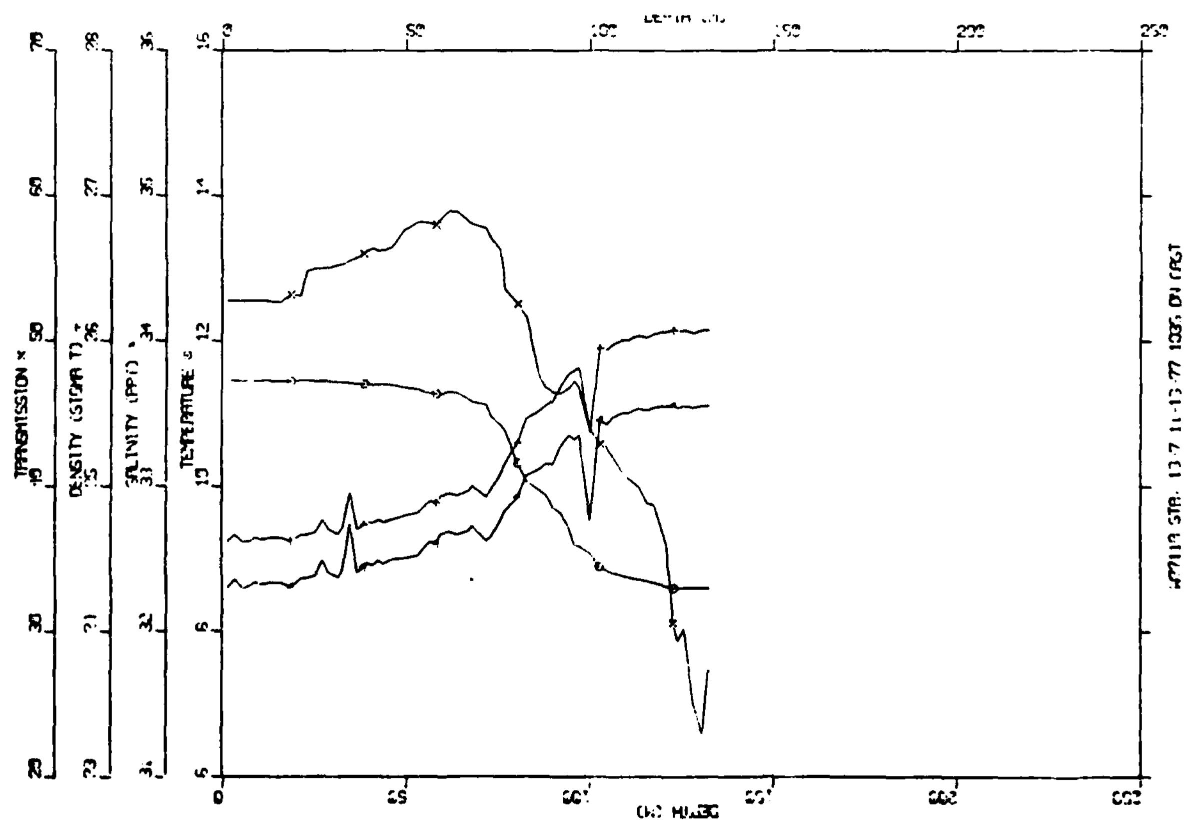
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C
W7719 STA. 13-6 11-13-77 3015 DN CAST

W77[illegible]1A STA 13-7 11-13-77 1035 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.47	32.32	24.64	43.97
10.0	11.46	32.33	24.64	52.80
15.0	11.46	32.33	24.65	52.81
20.0	11.47	32.35	24.66	53.36
25.0	11.46	32.41	24.71	54.96
30.0	11.45	32.41	24.71	55.20
35.0	11.43	32.57	24.83	55.61
40.0	11.42	32.47	24.76	56.28
45.0	11.41	32.49	24.78	56.57
50.0	11.37	32.52	24.81	57.60
60.0	11.29	32.67	24.94	58.57
70.0	11.13	32.68	24.97	57.83
80.0	10.39	32.94	25.31	52.65
90.0	9.75	33.19	25.61	46.60
100.0	9.07	33.09	25.63	44.44
110.0	8.77	33.51	26.01	40.86
120.0	8.65	33.56	26.07	36.11
130.0	8.60	33.56	26.08	24.96
132.4	8.60	33.56	26.08	26.33



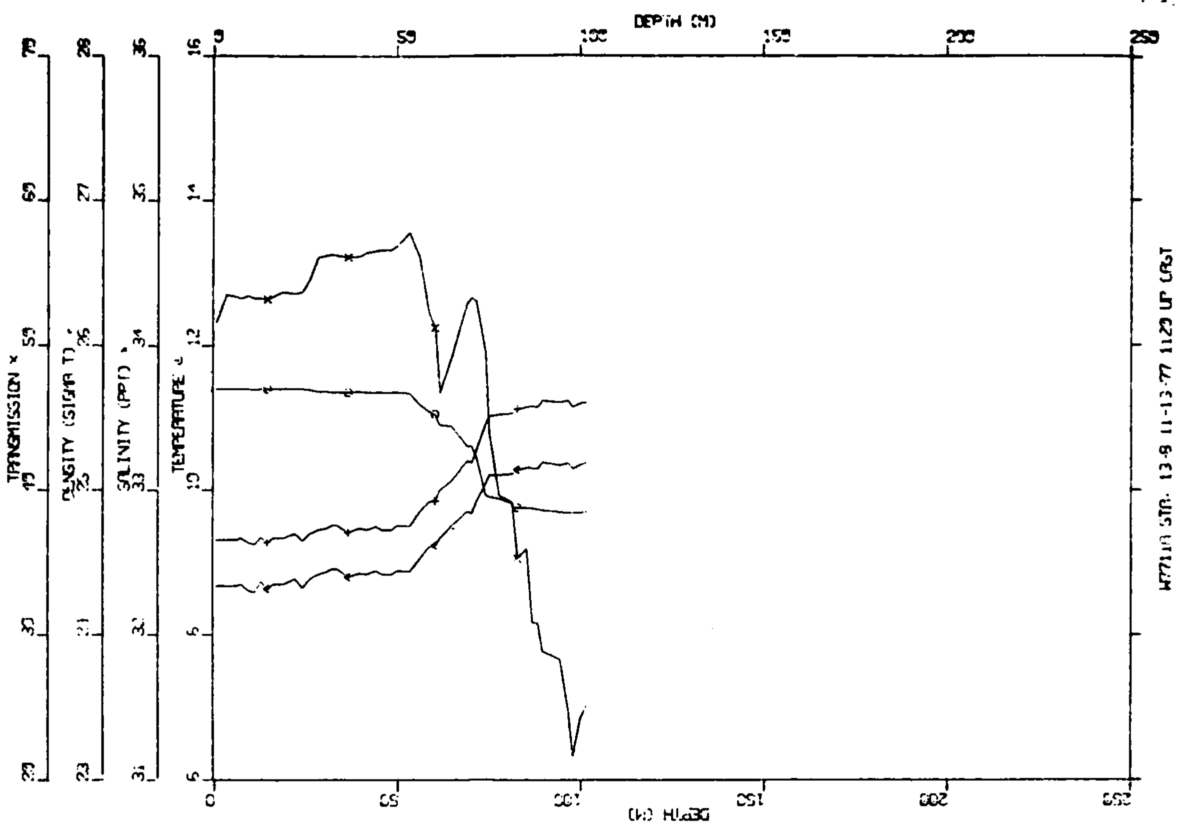
DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) +
TEMPERATURE o
UP CAST

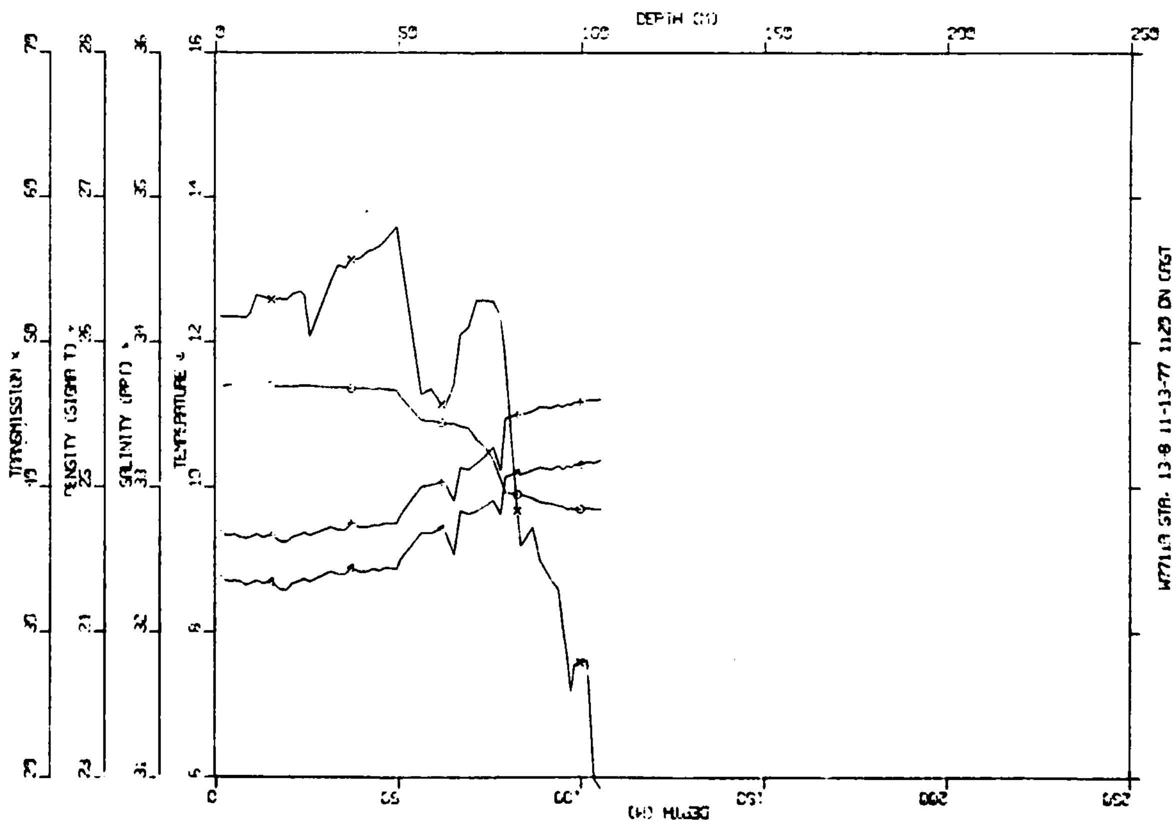


TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) +
TEMPERATURE o
DN CAST

W7711A STA 13-8 11-13-77 1120 DN CAST

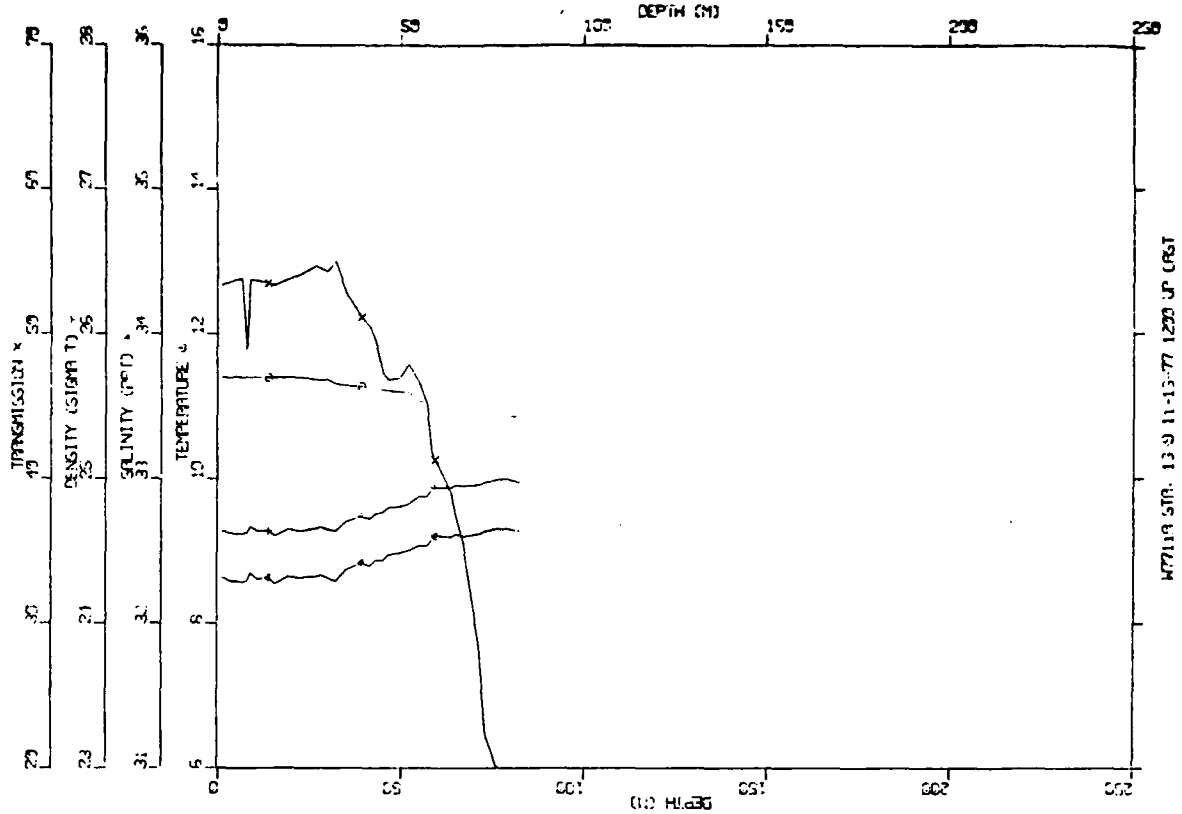
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.41	32.36	24.67	44.70
10.0	11.40	32.34	24.66	52.49
15.0	11.40	32.34	24.66	53.04
20.0	11.39	32.32	24.65	53.15
25.0	11.40	32.37	24.69	52.33
30.0	11.39	32.39	24.71	53.40
35.0	11.38	32.41	24.72	55.28
40.0	11.37	32.43	24.74	56.03
45.0	11.37	32.44	24.74	56.79
50.0	11.25	32.50	24.81	55.55
60.0	10.92	32.71	25.03	46.30
70.0	10.76	32.79	25.12	51.82
80.0	9.96	33.08	25.49	45.31
90.0	9.80	33.14	25.56	34.58
100.0	9.71	33.17	25.59	27.62
105.3	9.70	33.19	25.61	19.37

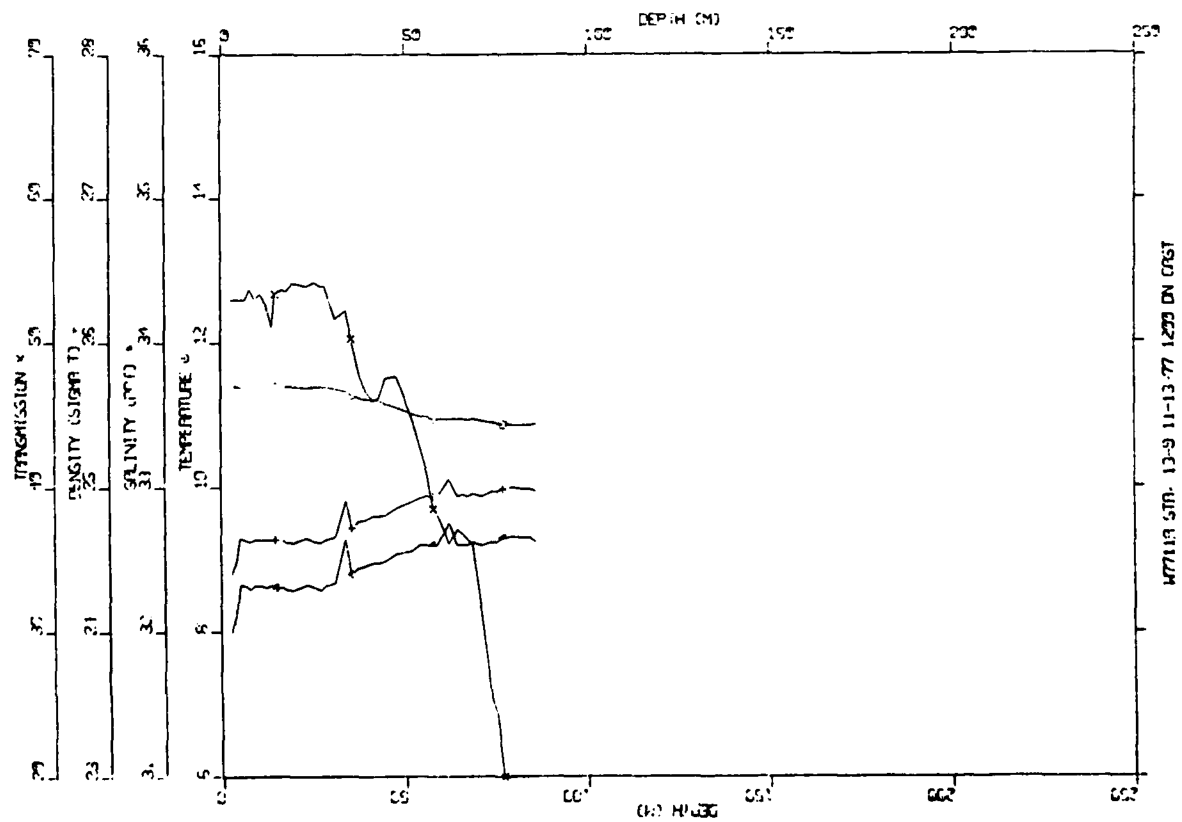

DEPTH (M)
TRANSMISSION
SALINITY (PPT)
TEMPERATURE


DEPTH (M)
TRANSMISSION
SALINITY (PPT)
TEMPERATURE

W7[illegible]1A STA 13-9 11-13-77 1200 DN CAST

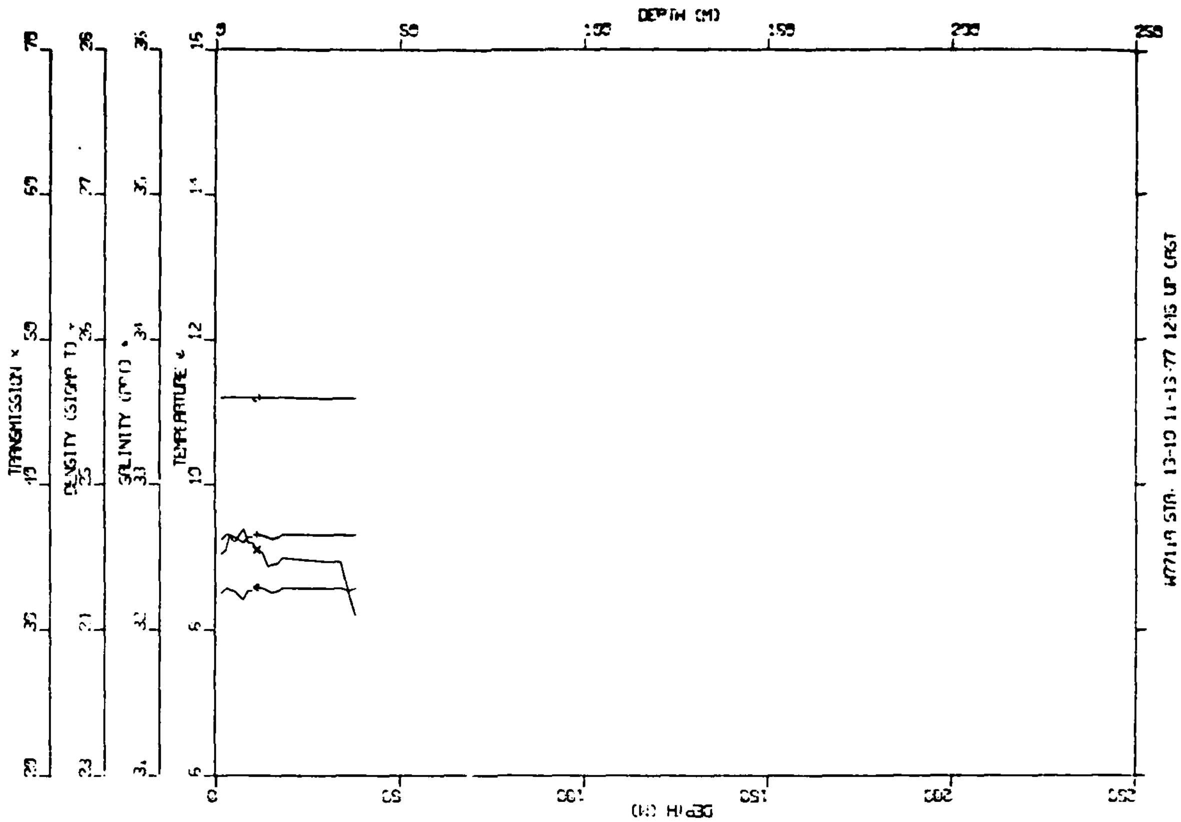
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.41	32.28	24.61	32.41
10.0	11.40	32.32	24.64	53.21
15.0	11.41	32.31	24.64	53.03
20.0	11.40	32.30	24.63	53.97
25.0	11.40	32.31	24.63	54.10
30.0	11.39	32.38	24.70	52.74
35.0	11.31	32.48	24.79	50.61
40.0	11.23	32.47	24.79	46.62
45.0	11.17	32.50	24.82	47.27
50.0	11.08	32.55	24.88	45.61
60.0	10.95	32.65	24.98	37.44
70.0	10.94	32.61	24.95	32.82
80.0	10.87	32.66	25.00	10.28
85.8	10.88	32.64	24.98	0.24

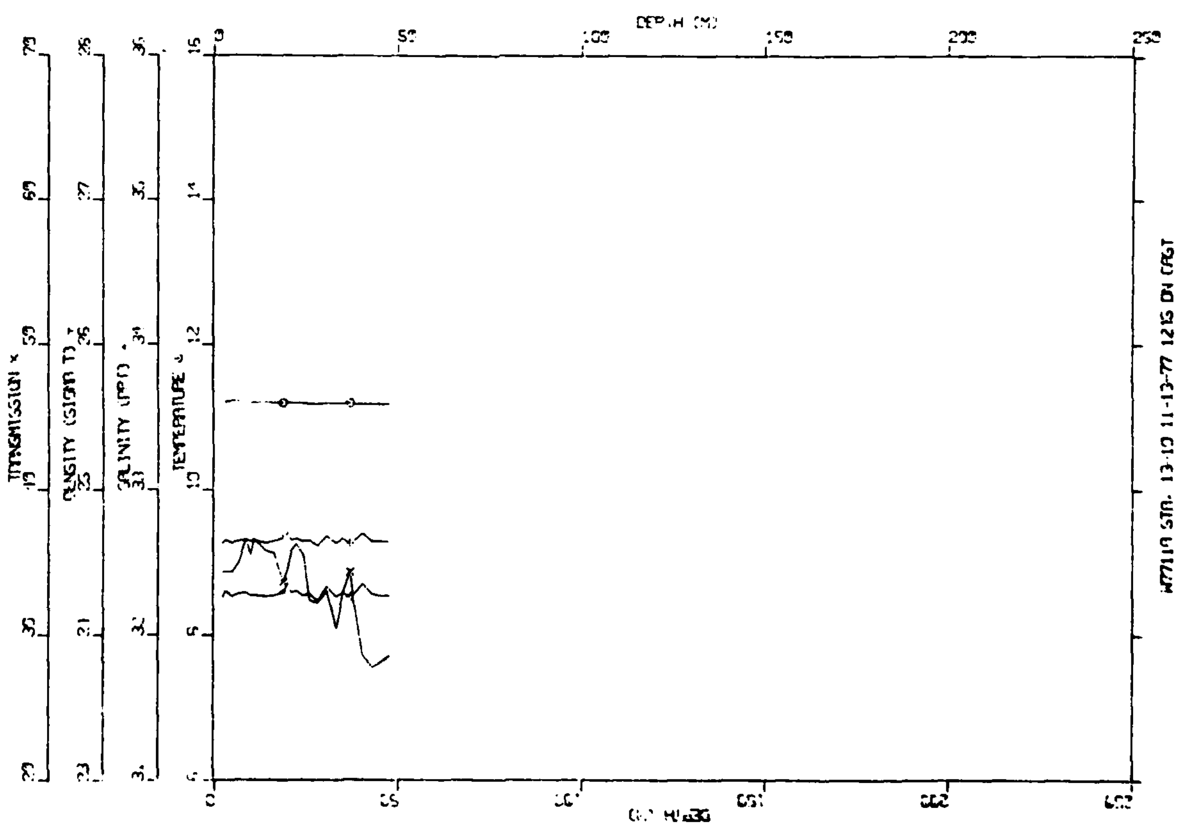

DEPTH (M)
TEMPERATURE
SALINITY (PPT)
DENSITY (SIGMA T)
TRANSMISSION
UP CAST


DEPTH (M)
TEMPERATURE
SALINITY (PPT)
DENSITY (SIGMA T)
TRANSMISSION
DN CAST

W7711A STA 13-10 11-13-77 1245 DN CAST

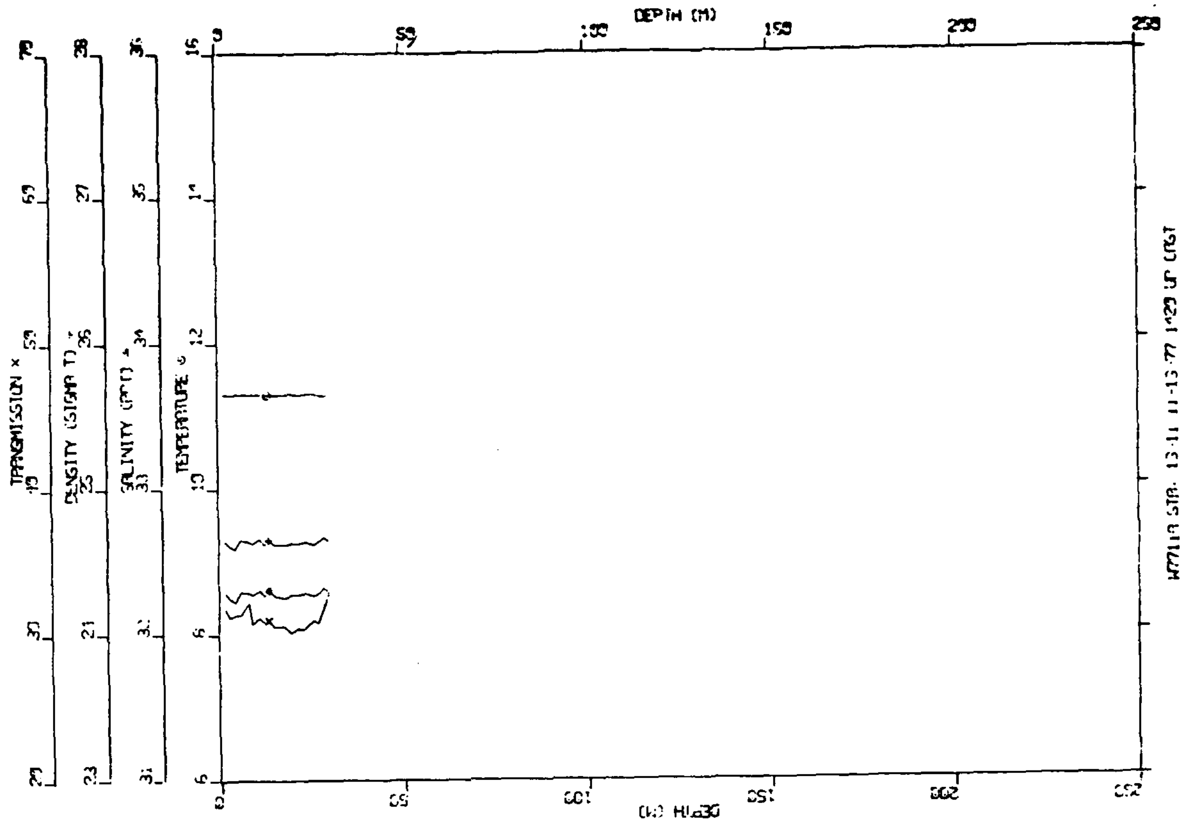
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.23	32.29	24.65	27.99
10.0	11.22	32.29	24.65	36.14
15.0	11.22	32.28	24.65	35.68
20.0	11.21	32.33	24.69	34.87
25.0	11.21	32.29	24.66	34.06
30.0	11.20	32.30	24.66	32.32
35.0	11.20	32.29	24.66	32.78
40.0	11.19	32.33	24.68	29.58
45.0	11.19	32.28	24.65	28.22
47.8	11.19	32.28	24.65	28.54


W7719 STA. 13-10 11-13-77 1215 UP CAST
DEPTH (M)
TEMPERATURE
SALINITY (PPT)
DENSITY (SIGMA T)
TRANSMISSION

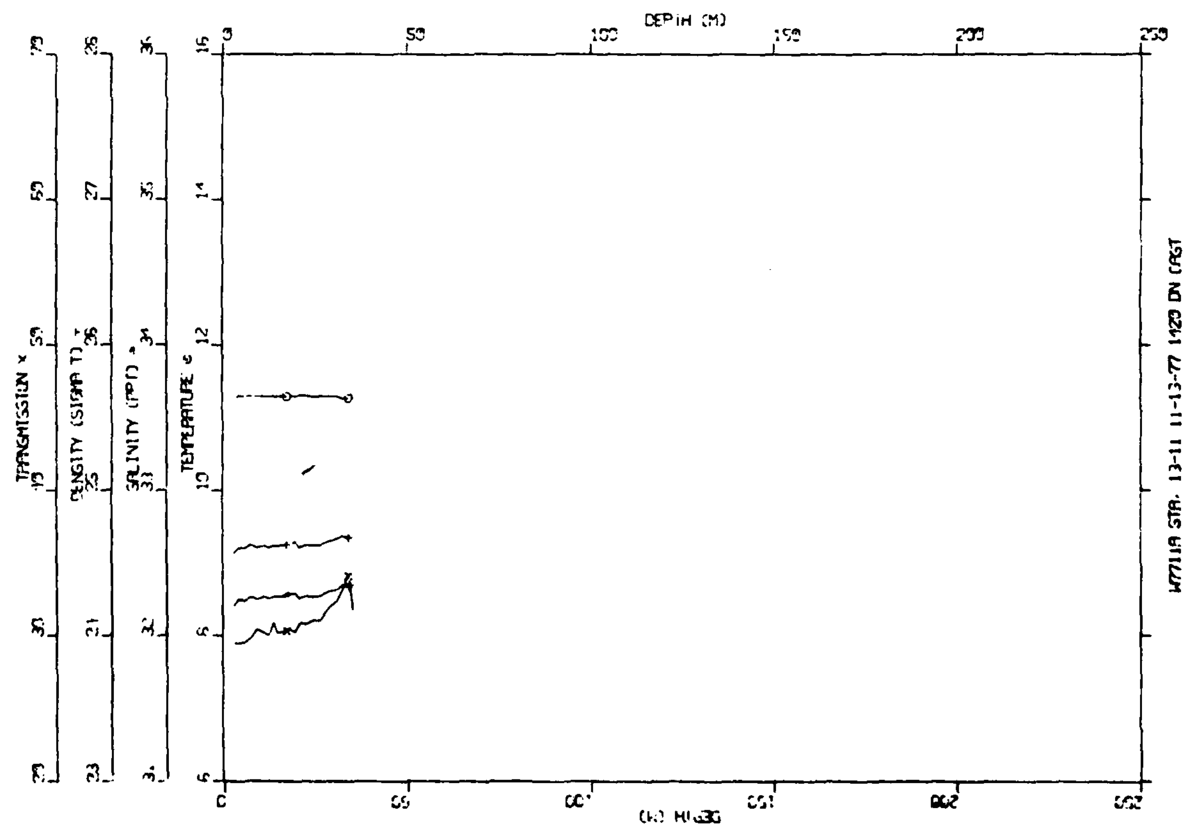

W7719 STA. 13-10 11-13-77 1215 DN CAST
DEPTH (M)
TEMPERATURE
SALINITY (PPT)
DENSITY (SIGMA T)
TRANSMISSION

W7711A STA 13-11 11-13-77 1420 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.31	32.25	24.61	26.17
10.0	11.31	32.26	24.62	30.26
15.0	11.31	32.27	24.62	30.43
20.0	11.32	32.29	24.64	30.58
25.0	11.31	32.29	24.64	31.15
30.0	11.30	32.32	24.66	32.31
35.0	11.28	32.35	24.69	32.53
33.9	11.28	32.35	24.69	32.41



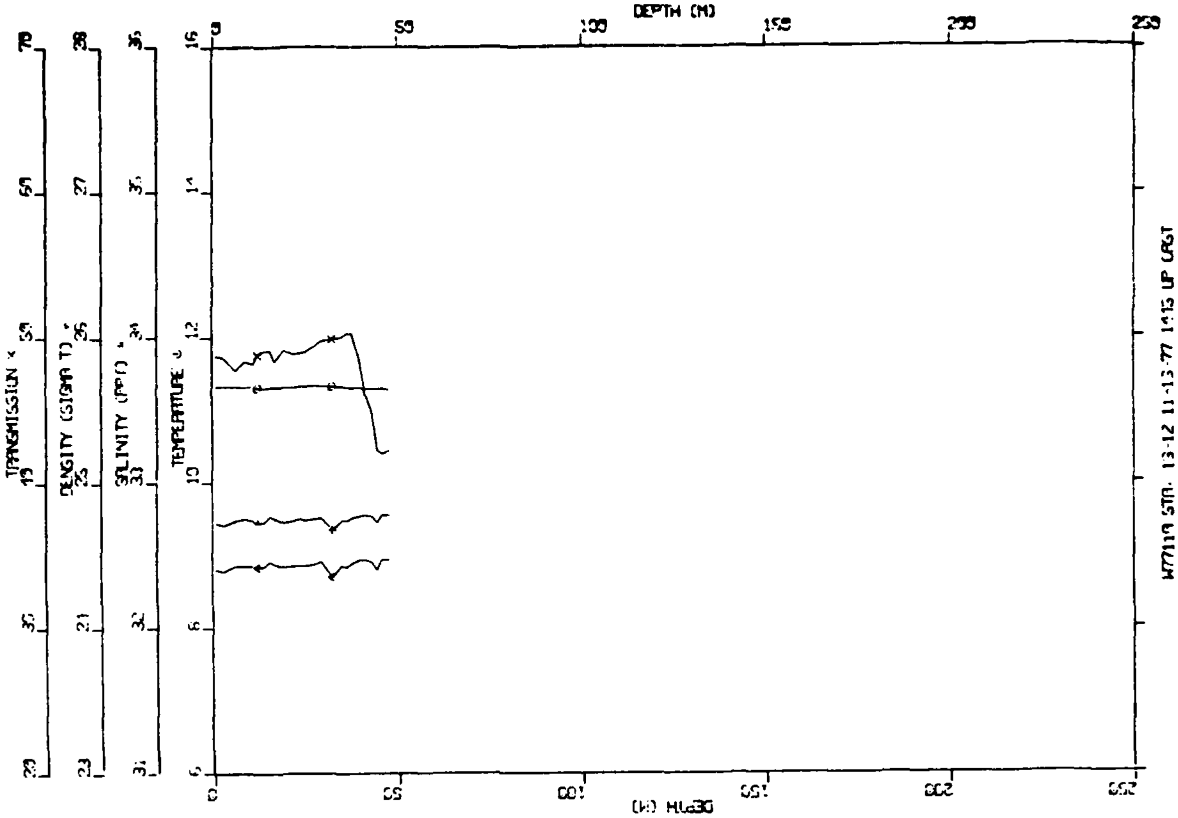
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE ◊

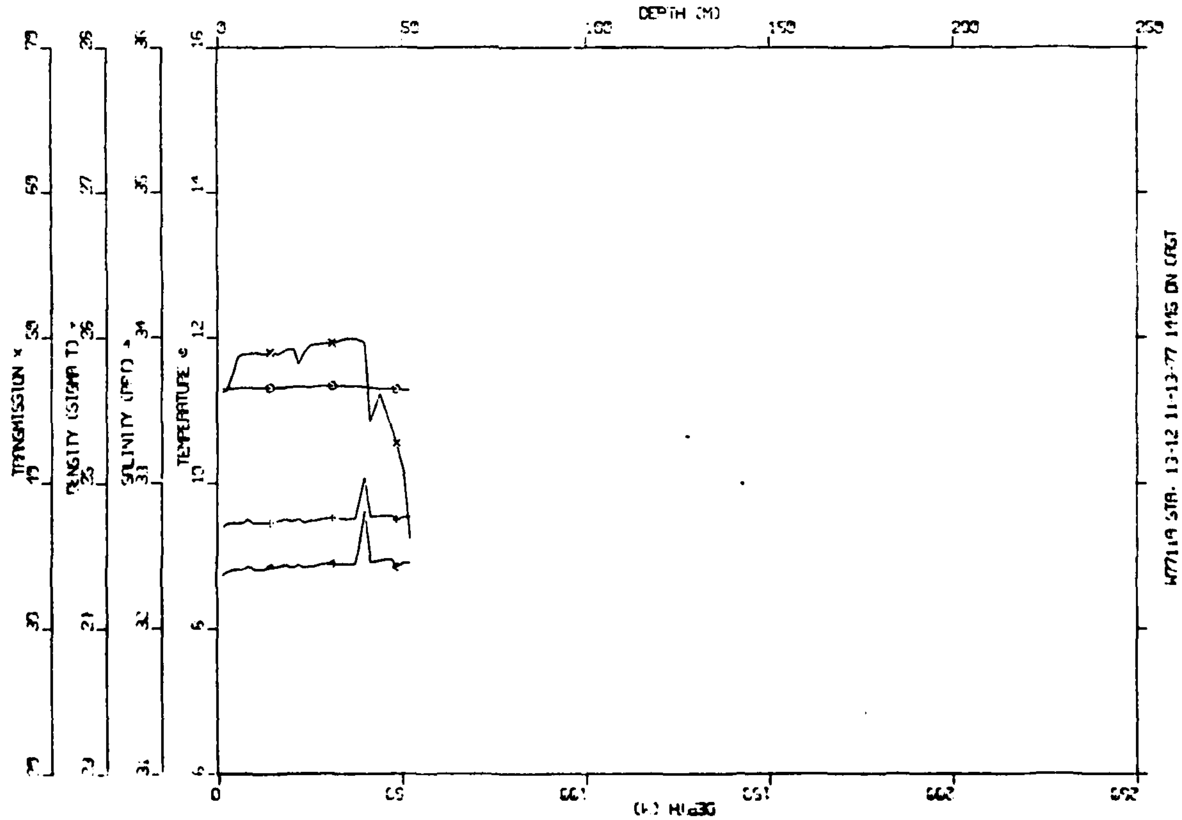


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE ◊

W7701A STA 13-12 11-13-77 1445 DN CAST

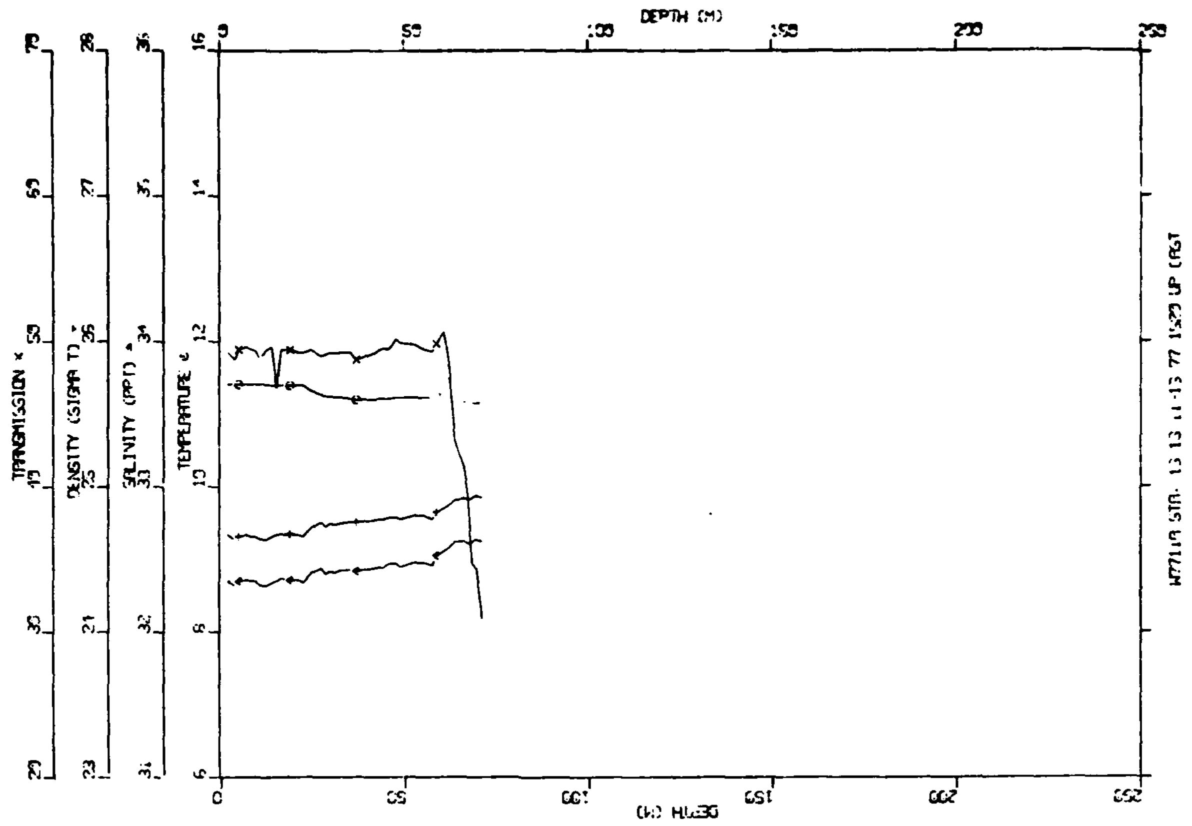
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.32	32.41	24.73	48.14
10.0	11.32	32.41	24.73	48.99
15.0	11.32	32.43	24.74	48.97
20.0	11.33	32.43	24.74	49.03
25.0	11.33	32.43	24.74	49.39
30.0	11.34	32.45	24.76	49.64
35.0	11.34	32.46	24.77	49.92
40.0	11.33	32.61	24.88	47.70
45.0	11.30	32.48	24.78	45.09
50.0	11.29	32.45	24.77	40.47
52.0	11.29	32.46	24.77	37.38

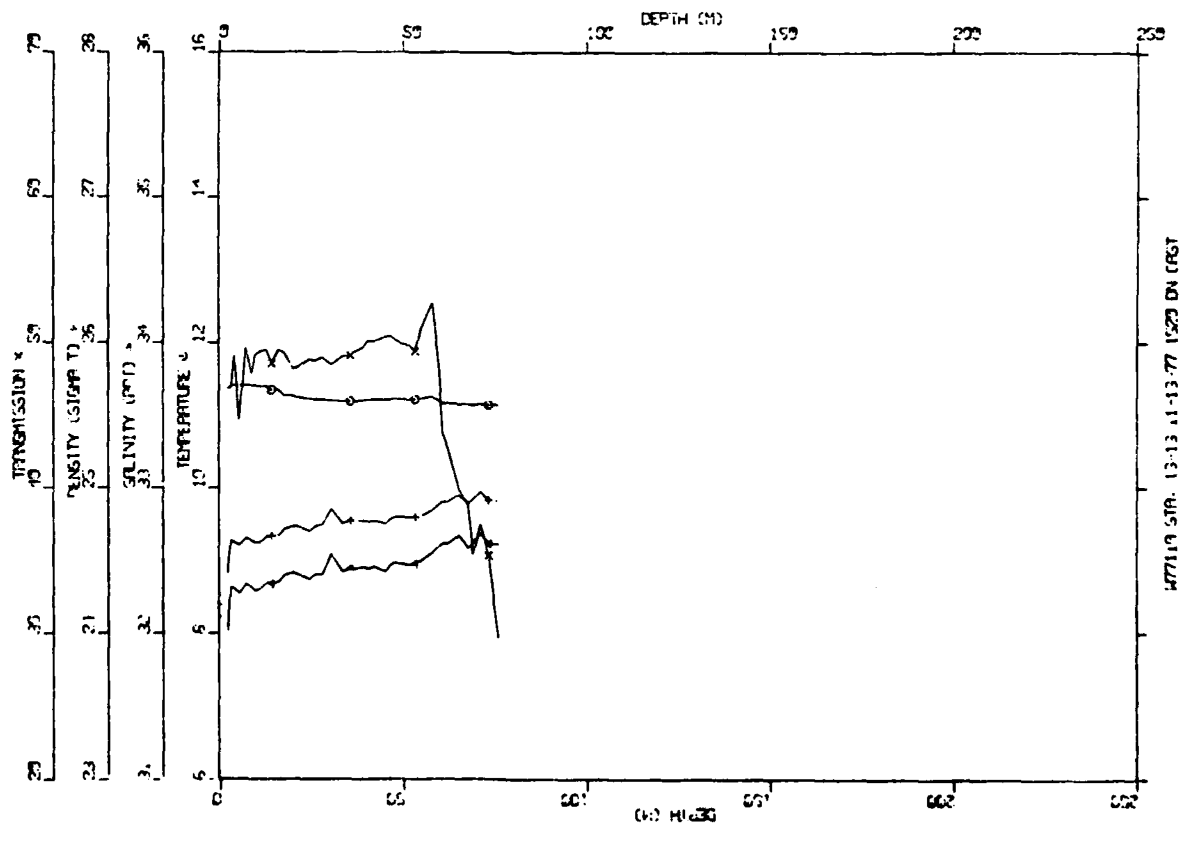

DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE ◇
W7719 STA. 13-12 11-13-77 1415 UP CAST


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE ◇
W7719 STA. 13-12 11-13-77 1415 DN CAST

W7711A STA 13-13 11-13-77 1520 DN CAST

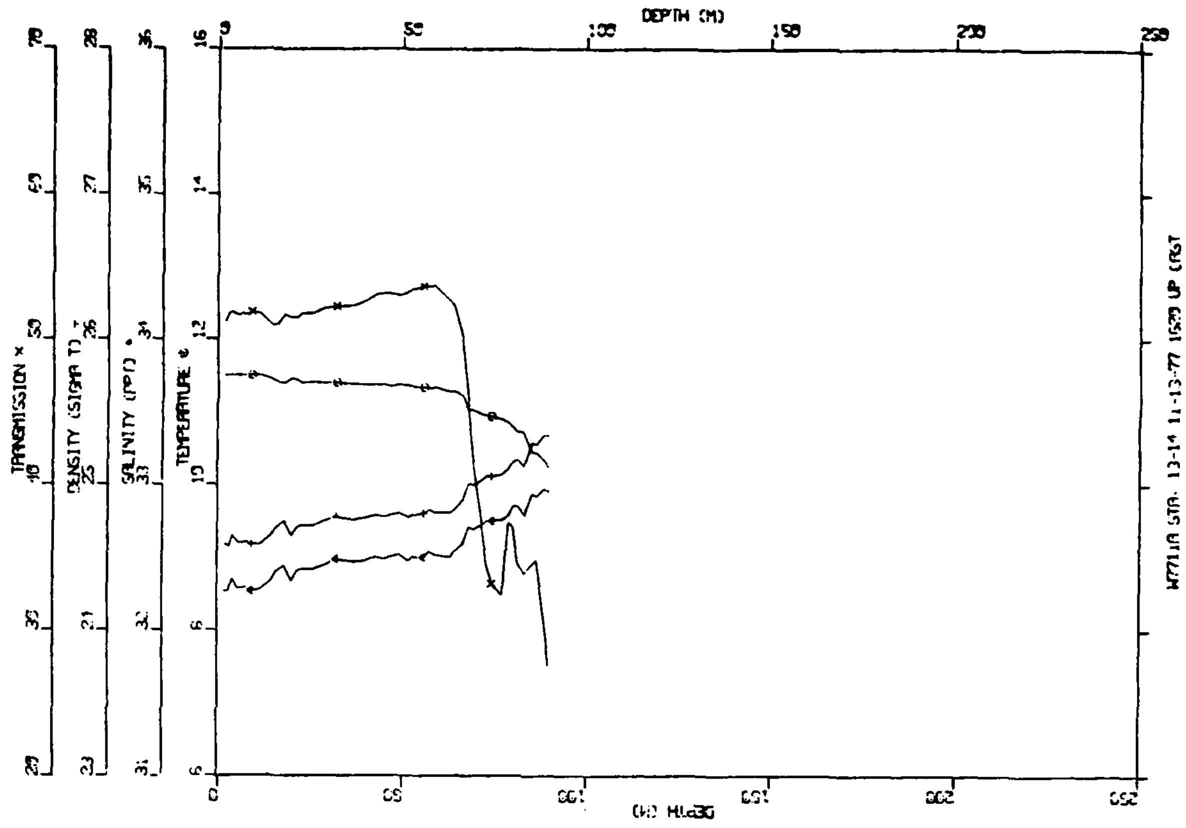
DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.42	32.30	24.63	47.13
10.0	11.42	32.31	24.63	49.04
15.0	11.36	32.36	24.68	49.15
20.0	11.27	32.41	24.74	48.50
25.0	11.24	32.40	24.74	48.78
30.0	11.22	32.49	24.81	48.80
35.0	11.21	32.46	24.78	49.15
40.0	11.23	32.46	24.78	49.99
45.0	11.23	32.45	24.77	50.40
50.0	11.23	32.48	24.80	50.01
60.0	11.21	32.61	24.90	47.19
70.0	11.17	32.65	24.95	36.61
75.6	11.16	32.62	24.92	31.18


DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C

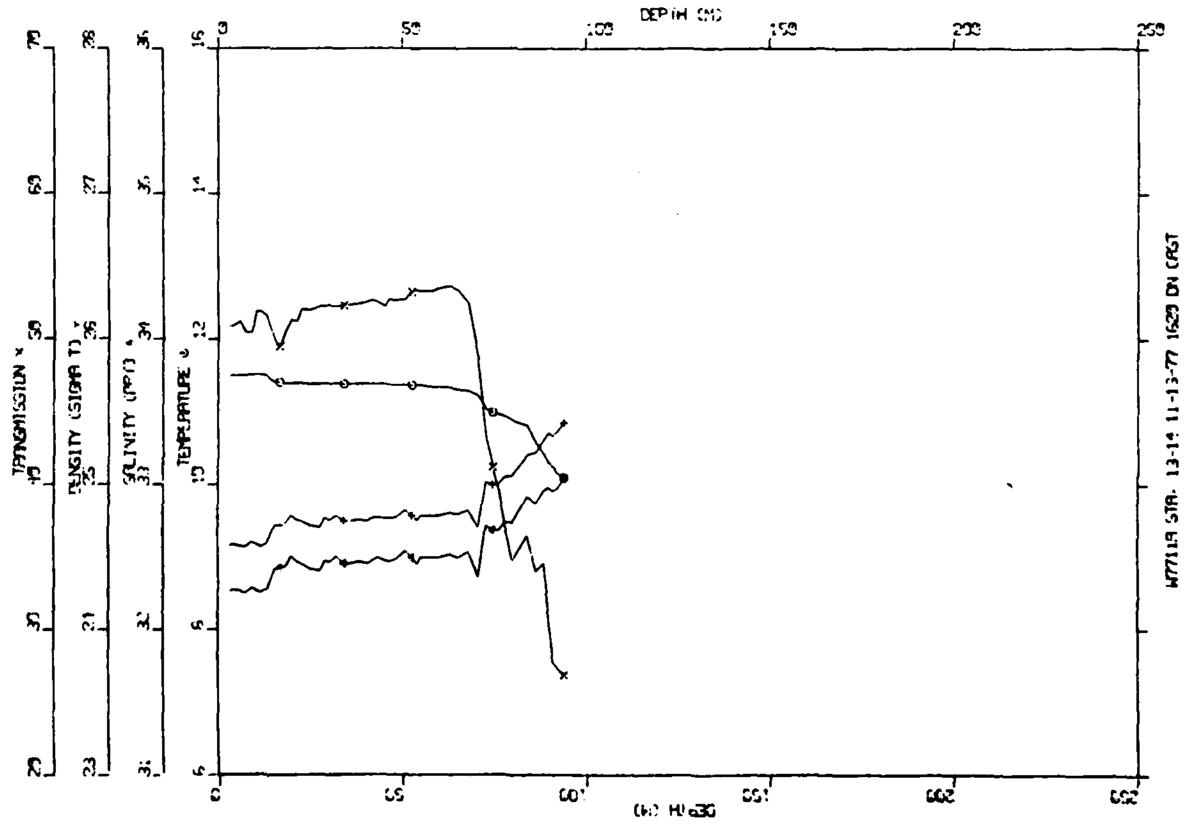

DEPTH (M)
TRANSMISSION %
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE C

W7711A STA 13-14 11-13-77 1620 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.51	32.27	24.58	50.97
10.0	11.52	32.27	24.59	51.53
15.0	11.44	32.39	24.69	50.24
20.0	11.40	32.48	24.77	51.24
25.0	11.39	32.43	24.73	52.13
30.0	11.39	32.48	24.77	52.29
35.0	11.39	32.46	24.75	52.37
40.0	11.39	32.47	24.76	52.56
45.0	11.39	32.48	24.77	52.46
50.0	11.38	32.52	24.81	52.87
60.0	11.36	32.51	24.80	53.50
70.0	11.22	32.50	24.82	48.91
80.0	10.89	32.80	25.11	35.87
90.0	10.29	32.97	25.34	30.18
93.9	10.12	33.03	25.42	27.03



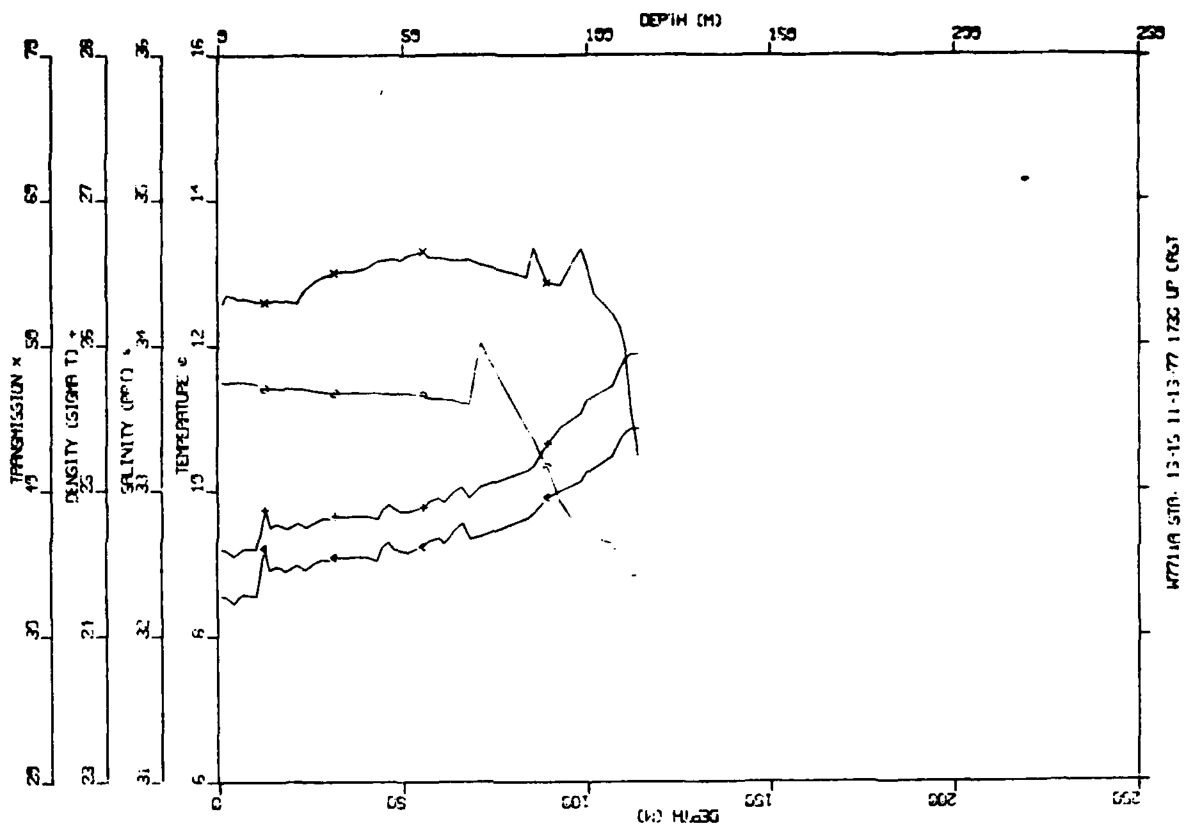
DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
W7719 STA. 13-14 11-13-77 1529 UP CAST

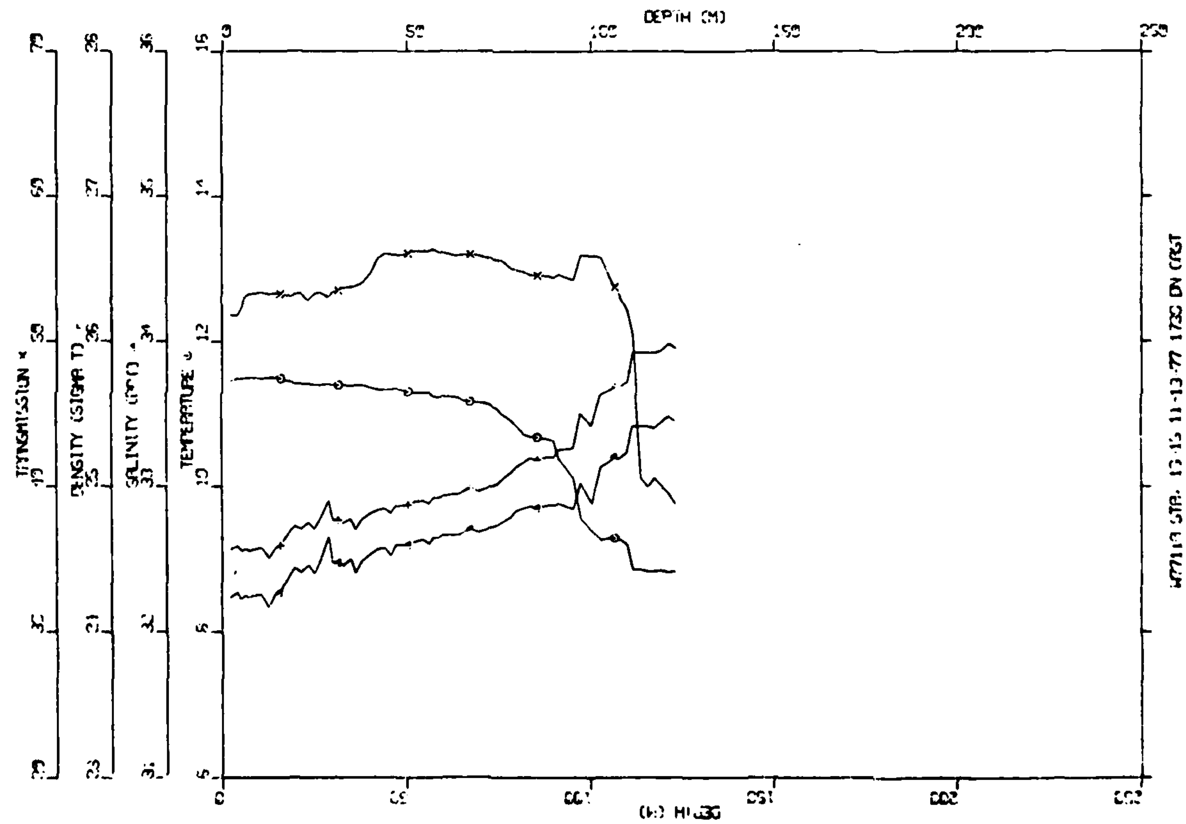


DEPTH (M)
TRANSMISSION ×
DENSITY (SIGMA T)
SALINITY (PPT)
TEMPERATURE
W7719 STA. 13-14 11-13-77 1629 DN CAST

W7[illegible]1A STA 13-15-11-13-77 1730 DN CAST

DEPTH	TEMP	SALINITY	SIGMA-T	%TRANS
5.0	11.49	32.25	24.57	52.43
10.0	11.50	32.24	24.56	53.35
15.0	11.49	32.28	24.59	53.31
20.0	11.43	32.42	24.72	53.24
25.0	11.41	32.45	24.75	53.24
30.0	11.41	32.51	24.79	53.39
35.0	11.40	32.46	24.76	53.81
40.0	11.37	32.54	24.82	54.80
45.0	11.34	32.56	24.84	56.02
50.0	11.33	32.61	24.88	56.11
60.0	11.25	32.67	24.94	56.12
70.0	11.17	32.70	24.98	55.90
80.0	10.84	32.84	25.15	54.94
90.0	10.58	32.88	25.22	54.54
100.0	9.43	32.99	25.50	55.93
110.0	9.14	33.29	25.78	51.82
120.0	8.84	33.46	25.96	39.88
122.9	8.84	33.47	25.97	39.07


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o
W7711A STA. 13-15 11-13-77 1730 UP CAST


DEPTH (M)
TRANSMISSION x
DENSITY (SIGMA T) +
SALINITY (PPT) *
TEMPERATURE o
W7711A STA. 13-15 11-13-77 1730 DN CAST

OPTICAL DATA

PARTICLE SIZE DISTRIBUTIONS

Particle size distributions were measured with an electronic particle sizer using 70 μm and 200 μm apertures. The effective size range is from 2.2 to 56.1 μm diameter. Each data window covers particle volume between half powers of 2 μm^3. For example the first window covers particles with volumes between $4\sqrt{2}$ and 8 μm^3 and the second window covers from 8 to $8\sqrt{2}$ μm^3.

Volume concentrations (p.p.m.) were computed by multiplying the particle concentration in each window by the average of the delimiting volumes of that window. Assuming a hyperbolic distribution, this method of computing volume concentrations gives a value 0.5 to 2% high for a reasonable range of slopes.

Slopes are computed by linear regression of the logarithms of the particle number concentration in windows versus the logarithm of the central diameter for each window. Assuming the hyperbolic distribution holds, this is mathematically equivalent to determining the cumulative slope. This method was compared (Kitchen, 1978) with the standard method for a cruise and the mean difference was found to be negligible and the correlation to be 0.96. The results of this method have been found to be exactly 1.00 less than the slopes computed from the differential size distribution. Thus the method using the histogram values is not only computationally simpler but also produces slopes correctly related to the more basic differential slopes.

The correlation coefficient for the log particle number vs. log diameter regression is given to show how nearly the particle

size distribution obeys the hyperbolic relationship. Departures from hyperbolic generally take the form of one to three bumps (concave downward), consisting of 4 to 10 data points each, superimposed on a generally linear (on a log number vs. log diameter scale) profile. Samples with correlation coefficients greater than 0.995 display only a slight curvature (concave downward) at the small end and fit the hyperbolic very well for the rest of the range. Correlations less than 0.990 indicate two or more bumps with increasing height as the correlation decreases.

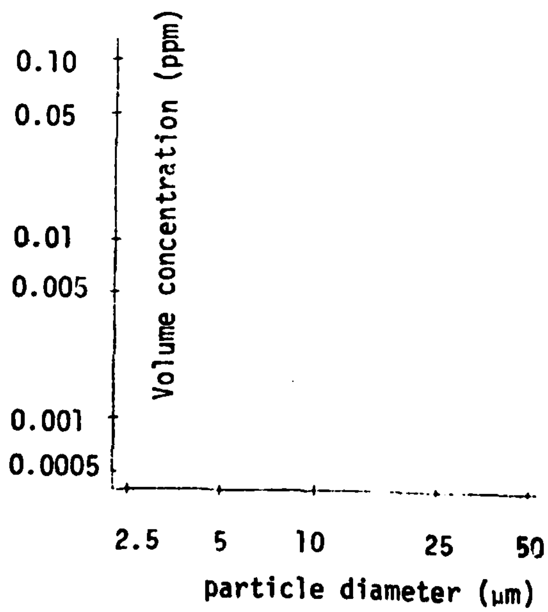
The size distributions are presented on a logarithmic volume concentation scale. The absolute units are given on a set of axes on the next page. Using the log concentration dampens the peaks but allow all samples to be meaningfully plotted on the same scale. Points centered on the abscissa are zero or missing data.

Some of the samples were bubbled with ozone and then recounted. The volume and slope parameters for these samples may be difficult to interpret, but the volume histograms provide some insight into the nature of the particles. Peaks representing flagellates are reduced to about 10% of their original volume while those representing diatoms are shifted about two windows to the left and have about half of the volume of the corresponding peak in the unozoned sample. Samples from deep nepheloid layers and some of the clean water samples show slight decreases at some sizes and increased volume after ozoning at other sizes. We interpret this to be caused by coagulation due to the bubbling process and/or the breaking up of aggregates that were originally offscale at the large end of the size distribution. The ozoning technique has little effect on

refractory organic matter and thus these very large aggregates that are broken up may be organic residues weakly bonded by a less refractory coating.

REFERENCE

Kitchen, J. C. 1978. Particle Size Distributions and the Vertical Distribution of Suspended Matter in the Upwelling Region off Oregon. M.S. thesis, Oregon State University, Corvallis, Oregon. 118 pp.



DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
07-01	350	METERS	.545	4.28	.9874
07-01	250	METERS	.195	4.00	.9928
07-01	200	METERS	.081	3.22	.9943
07-01	150	METERS	.063	3.23	.9972
07-01	100	METERS	.132	3.03	.9833
07-01	75	METERS	.111	3.28	.9944
07-01	50	METERS	.125	3.24	.9964
07-01	25	METERS	.233	2.87	.9941
07-01	0	METERS	.224	3.04	.9959
07-01	0	OZONED	.081	2.86	.9979
07-02	225	METERS	.188	3.90	.9971
07-02	200	METERS	.185	3.72	.9887
07-02	150	METERS	.107	3.38	.9970
07-02	150	OZONED	.071	3.60	.9939
07-02	100	METERS	.098	2.90	.9911
07-02	75	METERS	.113	2.84	.9921
07-02	50	METERS	.166	2.63	.9928
07-02	25	METERS	.259	3.14	.9910
07-02	0	METERS	.297	3.23	.9942
07-03	175	METERS	.604	4.01	.9848
07-03	150	METERS	.345	3.83	.9949
07-03	125	METERS	.571	4.58	.9930
07-03	100	METERS	.524	4.17	.9920
07-03	75	METERS	.082	3.04	.9938
07-03	50	METERS	.097	3.28	.9930
07-03	25	METERS	.254	3.06	.9888
07-03	10	METERS	.265	3.18	.9900
07-03	0	METERS	.238	3.09	.9883
07-04	150	METERS	.832	4.33	.9909
07-04	125	METERS	1.251	4.69	.9915
07-04	100	METERS	1.195	4.54	.9831
07-04	75	METERS	.507	4.07	.9940
07-04	50	METERS	.190	2.98	.9962
07-04	25	METERS	.301	3.23	.9919
07-04	10	METERS	.276	3.24	.9921
07-04	0	METERS	.270	3.15	.9943
07-05	139	METERS	1.137	4.09	.9865
07-05	125	METERS	1.257	4.82	.9913
07-05	100	METERS	1.237	4.55	.9924
07-05	75	METERS	.539	4.06	.9936
07-05	50	METERS	.344	3.81	.9931
07-05	50	OZONED	.107	3.41	.9937
07-05	25	METERS	.213	3.18	.9939
07-05	0	METERS	.284	3.30	.9958
07-05	0	OZONED	.079	3.02	.9888
07-06	115	METERS	1.162	3.90	.9915
07-06	115	OZONED	.807	4.15	.9960
07-06	100	METERS	.884	3.84	.9849
07-06	75	METERS	.316	3.54	.9971
07-06	50	METERS	.368	3.62	.9937

DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
07-06	25	METERS	.231	3.25	.9925
07-06	10	METERS	.284	3.06	.9952
07-06	0	METERS	.256	3.28	.9974
07-06	0	OZONED	.068	3.16	.9966
07-07	90	METERS	.854	3.63	.9912
07-07	90	OZONED	.637	3.57	.9913
07-07	75	METERS	.652	3.86	.9922
07-07	50	METERS	.524	3.74	.9933
07-07	25	METERS	.298	3.44	.9936
07-07	20	METERS	.332	3.52	.9948
07-07	15	METERS	.430	3.53	.9867
07-07	10	METERS	.470	3.53	.9866
07-07	5	METERS	.431	3.31	.9943
07-07	5	OZONED	.230	3.89	.9945
07-08	63	METERS	.916	3.66	.9922
07-08	63	OZONED	.520	3.80	.9942
07-08	50	METERS	.628	3.60	.9943
07-08	25	METERS	.424	3.52	.9923
07-08	25	OZONED	.272	3.81	.9972
07-08	10	METERS	.527	3.47	.9933
07-08	0	METERS	.404	3.42	.9897
07-08	0	OZONED	.210	3.76	.9987
07-09	150	METERS	.324	3.99	.9879
07-09	100	METERS	1.030	4.41	.9949
07-09	75	METERS	.713	4.14	.9918
07-09	75	OZONED	.337	4.15	.9977
07-09	50	METERS	.167	2.95	.9951
07-09	50	OZONED	.087	3.18	.9866
07-09	30	METERS	.238	3.17	.9924
07-09	20	METERS	.380	3.14	.9920
07-09	10	METERS	.370	3.20	.9946
07-10	150	METERS	.452	3.88	.9941
07-10	100	METERS	.352	3.73	.9903
07-10	100	OZONED	.387	3.93	.9963
07-10	75	METERS	.229	3.70	.9936
07-10	50	METERS	.111	2.80	.9932
07-10	30	METERS	.304	2.93	.9947
07-10	20	METERS	.233	3.09	.9923
07-10	10	METERS	.230	3.25	.9903
07-10	0	METERS	.237	2.92	.9927
07-10	0	OZONED	.089	2.72	.9898
08-01	150	METERS	.297	3.81	.9868
08-01	150	OZONED	.304	4.00	.9913
08-01	100	METERS	1.183	4.43	.9947
08-01	75	METERS	.144	3.07	.9950
08-01	50	METERS	.114	3.01	.9908
08-01	30	METERS	.216	3.05	.9911
08-01	20	METERS	.265	2.99	.9903
08-01	10	METERS	.263	2.97	.9891
08-01	0	METERS	.214	2.97	.9891

DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
08-01	0	OZONED	.114	2.75	.9955
08-02	150	METERS	.439	4.23	.9867
08-02	150	ozoned	.396	3.81	.9971
08-02	100	METERS	.328	3.68	.9891
08-02	75	METERS	.133	2.96	.9935
08-02	50	METERS	.102	2.85	.9907
08-02	30	METERS	.218	3.14	.9894
08-02	20	METERS	.233	3.21	.9941
08-02	10	METERS	.332	3.30	.9934
08-02	0	METERS	.208	3.15	.9949
08-02	0	OZONED	.092	3.10	.9940
08-03	150	METERS	.228	3.74	.9919
08-03	150	OZONED	.251	3.55	.9942
08-03	100	METERS	.607	3.87	.9967
08-03	75	METERS	1.052	4.58	.9929
08-03	50	METERS	.099	2.82	.9945
08-03	30	METERS	.222	3.10	.9911
08-03	20	METERS	.237	3.23	.9862
08-03	10	METERS	.237	3.00	.9886
08-03	0	METERS	.237	3.14	.9904
08-03	0	OZONED	.123	2.67	.9957
08-04	150	METERS	.427	3.97	.9929
08-04	100	METERS	.788	4.26	.9876
08-04	75	METERS	.706	4.23	.9907
08-04	75	OZONED	.490	4.00	.9936
08-04	50	METERS	.152	3.21	.9949
08-04	50	OZONED	.144	3.10	.9850
08-04	30	METERS	.183	3.37	.9957
08-04	20	METERS	.254	3.28	.9916
08-04	10	METERS	.232	3.26	.9898
08-04	0	METERS	.250	3.19	.9916
08-05	150	METERS	.345	3.94	.9888
08-05	150	OZONED	.293	3.68	.9946
08-05	100	METERS	.301	3.65	.9947
08-05	75	METERS	.393	4.06	.9884
08-05	50	METERS	.092	3.29	.9931
08-05	30	METERS	.244	3.31	.9928
08-05	20	METERS	.255	3.24	.9924
08-05	10	METERS	.269	3.20	.9898
08-05	0	METERS	.261	3.15	.9904
08-05	0	OZONED	.167	2.69	.9848
08-06	150	METERS	.464	3.87	.9891
08-06	100	METERS	.350	3.79	.9936
08-06	100	OZONED	.253	3.73	.9968
08-06	75	METERS	.693	4.38	.9907
08-06	75	OZONED	.459	4.26	.9913
08-06	50	METERS	.112	3.25	.9950
08-06	20	METERS	.308	3.19	.9911
08-06	10	METERS	.306	3.21	.9895
08-06	0	METERS	.291	3.34	.9903

DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
08-07	150	METERS	.392	3.85	.9917
08-07	150	OZONED	.273	3.73	.9953
08-07	100	METERS	.849	4.38	.9926
08-07	75	METERS	.093	3.09	.9972
08-07	50	METERS	.111	3.00	.9965
08-07	30	METERS	.250	3.09	.9913
08-07	20	METERS	.452	3.12	.9892
08-07	10	METERS	.314	3.28	.9888
08-07	0	METERS	.282	3.38	.9912
08-08	150	METERS	.646	4.01	.9855
08-08	100	METERS	1.035	4.36	.9901
08-08	0	METERS	.285	3.21	.9914
08-09	150	METERS	.455	3.97	.9830
08-09	150	OZONED	.157	3.26	.9830
08-09	75	METERS	.188	3.41	.9931
08-09	50	METERS	.144	2.75	.9907
08-09	30	METERS	.210	3.10	.9961
08-09	20	METERS	.332	3.06	.9937
08-09	10	METERS	.255	3.02	.9929
08-09	0	METERS	.304	3.18	.9914
08-09	0	OZONED	.172	2.41	.9776
08-10	150	METERS	.325	3.61	.9920
08-10	100	METERS	.211	3.35	.9915
08-10	75	METERS	.405	3.85	.9957
08-10	75	OZONED	.240	3.55	.9949
08-10	50	METERS	.134	3.06	.9946
08-10	50	OZONED	.095	2.83	.9858
08-10	30	METERS	.268	3.36	.9919
08-10	10	METERS	.330	3.12	.9901
08-10	0	METERS	.300	3.39	.9808
08-11	150	METERS	.532	3.92	.9895
08-11	150	OZONED	.317	3.70	.9975
08-11	100	METERS	.114	3.31	.9928
08-11	75	METERS	.436	3.84	.9952
08-11	50	METERS	.121	3.26	.9942
08-11	30	METERS	.235	3.24	.9941
08-11	20	METERS	.334	3.30	.9931
08-11	10	METERS	.339	3.17	.9871
08-11	0	METERS	.394	3.45	.9909
08-11	0	OZONED	.127	2.77	.9947
08-12	150	METERS	.598	3.97	.9867
08-12	100	METERS	.167	3.51	.9957
08-12	75	METERS	.116	3.12	.9950
08-12	50	METERS	.129	3.17	.9936
08-12	30	METERS	.286	3.25	.9920
08-12	20	METERS	.315	3.35	.9938
08-12	10	METERS	.312	3.24	.9929
08-12	0	METERS	.323	3.29	.9890
09-01	150	METERS	.639	4.16	.9848
09-01	150	OZONED	.418	4.09	.9893

DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
09-01	100	METERS	.636	4.08	.9907
09-01	75	METERS	.120	3.36	.9968
09-01	50	METERS	.104	3.07	.9985
09-01	30	METERS	.278	3.24	.9935
09-01	20	METERS	.299	3.16	.9919
09-01	10	METERS	.279	3.35	.9909
09-01	0	METERS	.297	3.40	.9908
09-01	0	OZONED	.078	2.91	.9914
09-02	150	METERS	.307	3.68	.9925
09-02	150	OZONED	.175	3.52	.9980
09-02	100	METERS	.165	3.55	.9878
09-02	75	METERS	.109	3.13	.9943
09-02	50	METERS	.208	3.18	.9942
09-02	30	METERS	.237	3.30	.9925
09-02	20	METERS	.293	3.27	.9908
09-02	10	METERS	.330	3.27	.9888
09-02	0	METERS	.124	2.62	.9857
09-03	150	METERS	.500	4.00	.9911
09-03	100	METERS	.134	3.36	.9905
09-03	75	METERS	.103	3.21	.9957
09-03	50	METERS	.154	2.98	.9958
09-03	20	METERS	.230	3.21	.9908
09-03	10	METERS	.364	3.44	.9922
09-03	0	METERS	.224	3.21	.9892
09-03	0	OZONED	.099	3.10	.9913
09-04	150	METERS	.623	3.93	.9915
09-04	100	METERS	.112	3.46	.9958
09-04	75	METERS	.147	2.92	.9918
09-04	50	METERS	.114	3.17	.9958
09-04	30	METERS	.211	3.06	.9948
09-04	20	METERS	.293	3.48	.9907
09-04	10	METERS	.342	3.36	.9884
09-04	0	METERS	.272	3.49	.9902
09-05	48	METERS	1.531	3.70	.9948
09-05	48	METERS	1.198	4.07	.9934
09-05	40	METERS	.909	3.58	.9907
09-05	30	METERS	.657	3.61	.9881
09-05	20	METERS	.405	3.22	.9945
09-05	10	METERS	.423	3.42	.9926
09-05	0	METERS	.429	3.44	.9954
09-06	83	METERS	1.006	3.53	.9905
09-06	70	METERS	.545	3.62	.9942
09-06	60	METERS	.241	3.67	.9948
09-06	50	METERS	.196	3.56	.9962
09-06	40	METERS	.325	3.24	.9960
09-06	30	METERS	.294	3.44	.9929
09-06	15	METERS	.283	3.62	.9903
09-06	0	METERS	.295	3.31	.9933
09-07	90	METERS	1.094	3.89	.9903
09-07	75	METERS	.363	3.60	.9924

DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
09-07	60	METERS	.417	3.56	.9937
09-07	50	METERS	.257	3.71	.9947
09-07	40	METERS	.190	3.67	.9949
09-07	30	METERS	.353	3.39	.9964
09-07	15	METERS	.339	3.64	.9907
09-07	0	METERS	.330	3.63	.9940
09-08	115	METERS	.882	3.87	.9881
09-08	100	METERS	.852	4.16	.9919
09-08	75	METERS	.229	3.60	.9951
09-08	30	METERS	.292	3.26	.9947
09-08	15	METERS	.452	3.42	.9835
09-08	0	METERS	.450	3.37	.9899
09-09	150	METERS	.696	3.93	.9914
09-09	140	METERS	.349	3.85	.9955
09-09	110	METERS	.928	4.34	.9943
09-09	75	METERS	.150	3.39	.9952
09-09	50	METERS	.316	3.27	.9941
09-09	30	METERS	.340	3.27	.9885
09-09	10	METERS	.377	3.20	.9922
09-09	0	METERS	.319	3.05	.9925
09-10	165	METERS	.861	3.74	.9885
09-10	130	METERS	.383	3.94	.9954
09-10	100	METERS	.091	3.18	.9925
09-10	75	METERS	.120	3.02	.9933
09-10	50	METERS	.163	3.15	.9971
09-10	30	METERS	.371	3.05	.9934
09-10	30	OZONED	.196	3.22	.9917
09-10	20	METERS	.456	3.20	.9905
09-10	10	METERS	.425	3.09	.9887
09-10	10	OZONED	.149	2.84	.9913
09-10	0	METERS	.411	3.28	.9860
10-01	190	METERS	.679	3.84	.9835
10-01	125	METERS	.142	3.67	.9928
10-01	100	METERS	.103	2.86	.9972
10-01	50	METERS	.140	2.86	.9965
10-01	30	METERS	.410	3.04	.9851
10-01	10	METERS	.373	2.97	.9907
10-01	0	METERS	.367	2.93	.9919
10-02	254	METERS	.130	3.15	.9941
10-02	200	METERS	.181	3.53	.9907
10-02	150	METERS	.112	3.45	.9905
10-02	100	METERS	.106	3.09	.9965
10-02	75	METERS	.094	2.82	.9948
10-02	50	METERS	.163	2.89	.9930
10-02	30	METERS	.414	3.22	.9929
10-02	15	METERS	.351	3.04	.9898
10-02	0	METERS	.356	3.05	.9906
10-03	300	METERS	.064	3.10	.9974
10-03	250	METERS	.061	3.53	.9891
10-03	200	METERS	.102	3.54	.9953

DOE CRUISE W7711A

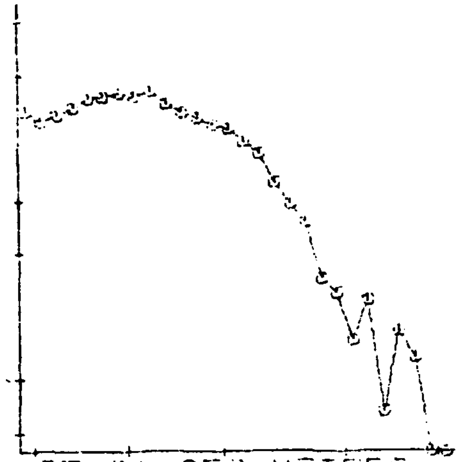
STAT.	DPH		VOL.	CUM SLP	CORR.
10-03	150	METERS	.111	3.55	.9883
10-03	100	METERS	.096	3.23	.9935
10-03	75	METERS	.140	3.31	.9358
10-03	50	METERS	.162	3.03	.9898
10-03	30	METERS	.373	3.20	.9917
10-04	310	METERS	.144	3.72	.9893
10-04	250	METERS	.136	3.55	.9959
10-04	200	METERS	.104	3.48	.9959
10-04	150	METERS	.091	3.46	.9969
10-04	100	METERS	.138	3.38	.9935
10-04	75	METERS	.139	3.19	.9928
10-04	50	METERS	.143	2.99	.9977
10-04	30	METERS	.328	2.90	.9932
10-04	10	METERS	.348	3.07	.9939
10-04	0	METERS	.364	3.12	.9878
10-05	180	METERS	1.394	3.39	.9820
10-05	150	METERS	.211	4.04	.9832
10-05	100	METERS	.082	3.15	.9971
10-05	75	METERS	.112	3.15	.9938
10-05	50	METERS	.100	2.88	.9945
10-05	30	METERS	.341	3.12	.9912
10-05	10	METERS	.380	2.98	.9915
10-05	0	METERS	.438	3.10	.9912
10-06	165	METERS	.951	4.06	.9779
10-06	165	OZONED	.571	3.93	.9944
10-06	140	METERS	.470	4.06	.9875
10-06	140	OZONED	.281	4.30	.9938
10-06	120	METERS	.379	3.93	.9948
10-06	120	OZONED	.273	3.78	.9776
10-06	100	METERS	.278	3.91	.9906
10-06	100	OZONED	.108	3.89	.9925
10-06	75	METERS	.130	3.12	.9988
10-06	50	METERS	.128	3.14	.9935
10-06	30	METERS	.346	3.11	.9904
10-06	15	METERS	.472	3.00	.9890
10-06	0	METERS	.467	3.01	.9854
10-07	155	METERS	.738	4.12	.9838
10-07	100	METERS	.145	3.17	.9970
10-07	75	METERS	.109	3.33	.9970
10-07	50	METERS	.109	2.83	.9923
10-07	30	METERS	.296	3.02	.9896
10-07	15	METERS	.345	3.06	.9915
10-07	0	METERS	.321	2.87	.9907
10-08	130	METERS	.953	3.93	.9851
10-08	100	METERS	.871	4.13	.9911
10-08	75	METERS	.238	3.50	.9910
10-08	50	METERS	.240	3.33	.9892
10-08	30	METERS	.210	3.35	.9970
10-08	15	METERS	.335	3.35	.9933
10-08	0	METERS	.303	3.44	.9915

DOE CRUISE W7711A

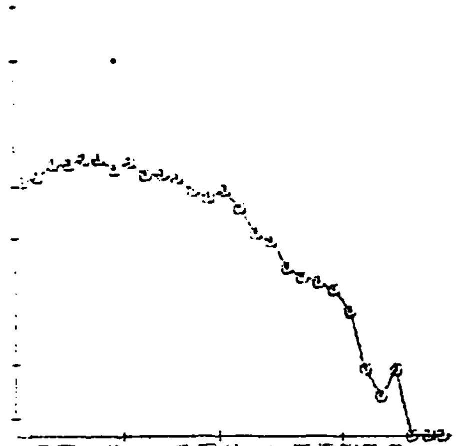
STAT.	DPH		VOL.	CUM SLP	CORR.
10-09	98	METERS	.647	4.11	.9928
10-09	80	METERS	.483	3.91	.9947
10-09	60	METERS	.261	3.71	.9913
10-09	40	METERS	.173	3.56	.9899
10-09	20	METERS	.326	3.07	.9958
10-09	10	METERS	.395	3.22	.9931
10-09	0	METERS	.364	3.39	.9924
10-10	80	METERS	1.198	3.61	.9919
10-10	65	METERS	.383	3.73	.9928
10-10	50	METERS	.338	3.69	.9935
10-10	35	METERS	.449	3.81	.9953
10-10	20	METERS	.383	3.44	.9930
10-10	10	METERS	.331	3.61	.9898
10-10	0	METERS	.387	3.59	.9914
11-01	40	METERS	.772	3.83	.9946
11-01	30	METERS	.388	3.66	.9949
11-01	20	METERS	.428	3.65	.9933
11-01	10	METERS	.423	3.66	.9885
11-01	0	METERS	.477	3.75	.9914
11-02	203	METERS	.706	4.11	.9865
11-02	180	METERS	.219	3.90	.9833
11-02	150	METERS	.067	3.24	.9962
11-02	100	METERS	.297	3.23	.9927
11-02	75	METERS	.113	3.26	.9912
11-02	30	METERS	.330	3.41	.9917
11-02	10	METERS	.318	3.30	.9911
11-02	0	METERS	.290	3.31	.9907
11-04	204	METERS	1.472	4.07	.9894
11-04	204	OZONED	.706	4.32	.9918
11-04	180	METERS	.105	3.45	.9913
11-04	150	METERS	.050	2.97	.9917
11-04	100	METERS	.116	3.14	.9961
11-04	75	METERS	.111	3.08	.9949
11-04	50	METERS	.200	2.85	.9969
11-04	30	METERS	.408	2.83	.9897
11-04	15	METERS	.363	2.96	.9912
11-04	0	METERS	.369	2.82	.9922
11-04	0	OZONED	.140	2.78	.9929
11-05	210	METERS	1.230	4.21	.9938
11-05	175	METERS	.133	3.75	.9939
11-05	150	METERS	.075	3.34	.9949
11-05	100	METERS	.152	3.54	.9971
11-05	75	METERS	.133	3.44	.9935
11-05	50	METERS	.144	2.79	.9951
11-05	30	METERS	.324	2.92	.9922
11-05	30	OZONED	.171	2.78	.9960
11-05	15	METERS	.414	2.95	.9881
11-05	15	OZONED	.156	2.76	.9923
11-05	0	METERS	.438	3.05	.9940
11-06	210	METERS	.871	4.07	.9910

DOE CRUISE W7711A

STAT.	DPH		VOL.	CUM SLP	CORR.
11-06	175	METERS	.089	3.38	.9936
11-06	100	METERS	.099	3.24	.9924
11-06	75	METERS	.105	3.36	.9886
11-06	50	METERS	.227	3.02	.9908
11-06	30	METERS	.268	3.08	.9909
11-05	15	METERS	.292	3.23	.9892
11-06	0	METERS	.306	3.13	.9911
12-01	210	METERS	.906	4.07	.9861
12-01	175	METERS	.167	3.68	.9926
12-01	150	METERS	.084	3.09	.9880
12-01	100	METERS	.157	3.22	.9980
12-01	75	METERS	.105	3.29	.9946
12-01	50	METERS	.120	3.18	.9956
12-01	30	METERS	.280	3.15	.9817
12-01	15	METERS	.301	3.01	.9924
12-01	0	METERS	.249	2.98	.9807
12-02	223	METERS	.899	4.10	.9873
12-02	160	METERS	.129	3.48	.9963
12-02	100	METERS	.127	3.37	.9934
12-02	75	METERS	.143	3.25	.9954
12-02	30	METERS	.276	2.88	.9833
12-02	15	METERS	.292	2.83	.9920
12-02	0	METERS	.265	3.02	.9904
13-01	215	METERS	.958	4.32	.9883
13-01	175	METERS	.139	3.74	.9944
13-01	150	METERS	.084	3.34	.9954
13-01	100	METERS	.105	3.30	.9914
13-01	75	METERS	.247	3.74	.9897
13-01	50	METERS	.242	3.74	.9935
13-01	30	METERS	.274	3.59	.9934
13-01	15	METERS	.245	3.47	.9925
13-01	0	METERS	.219	3.45	.9915



07-01 350 METERS



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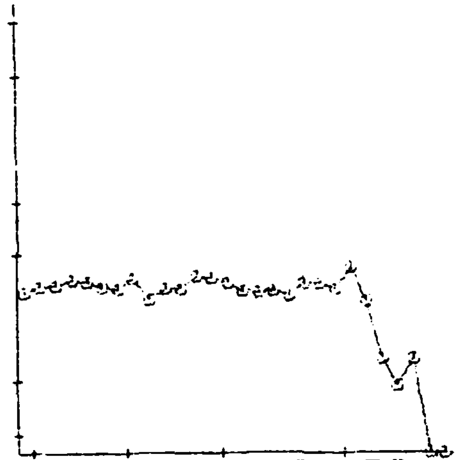

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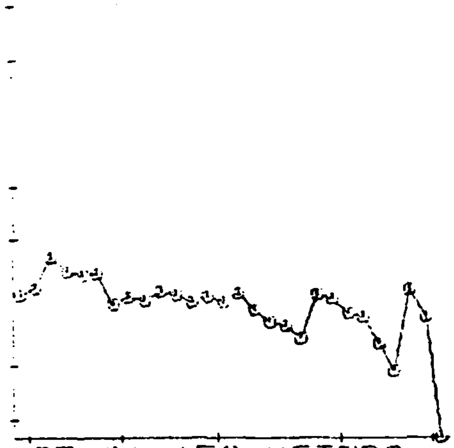

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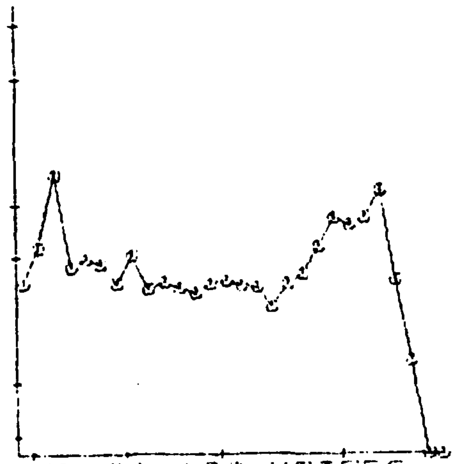

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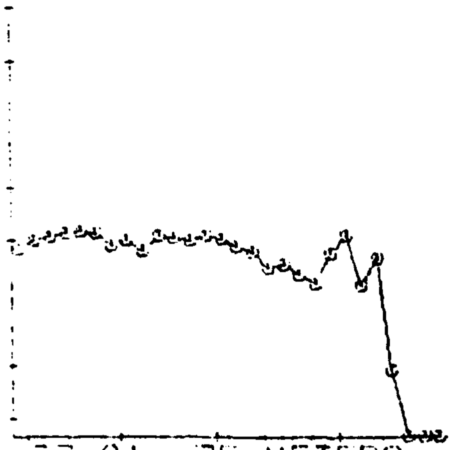

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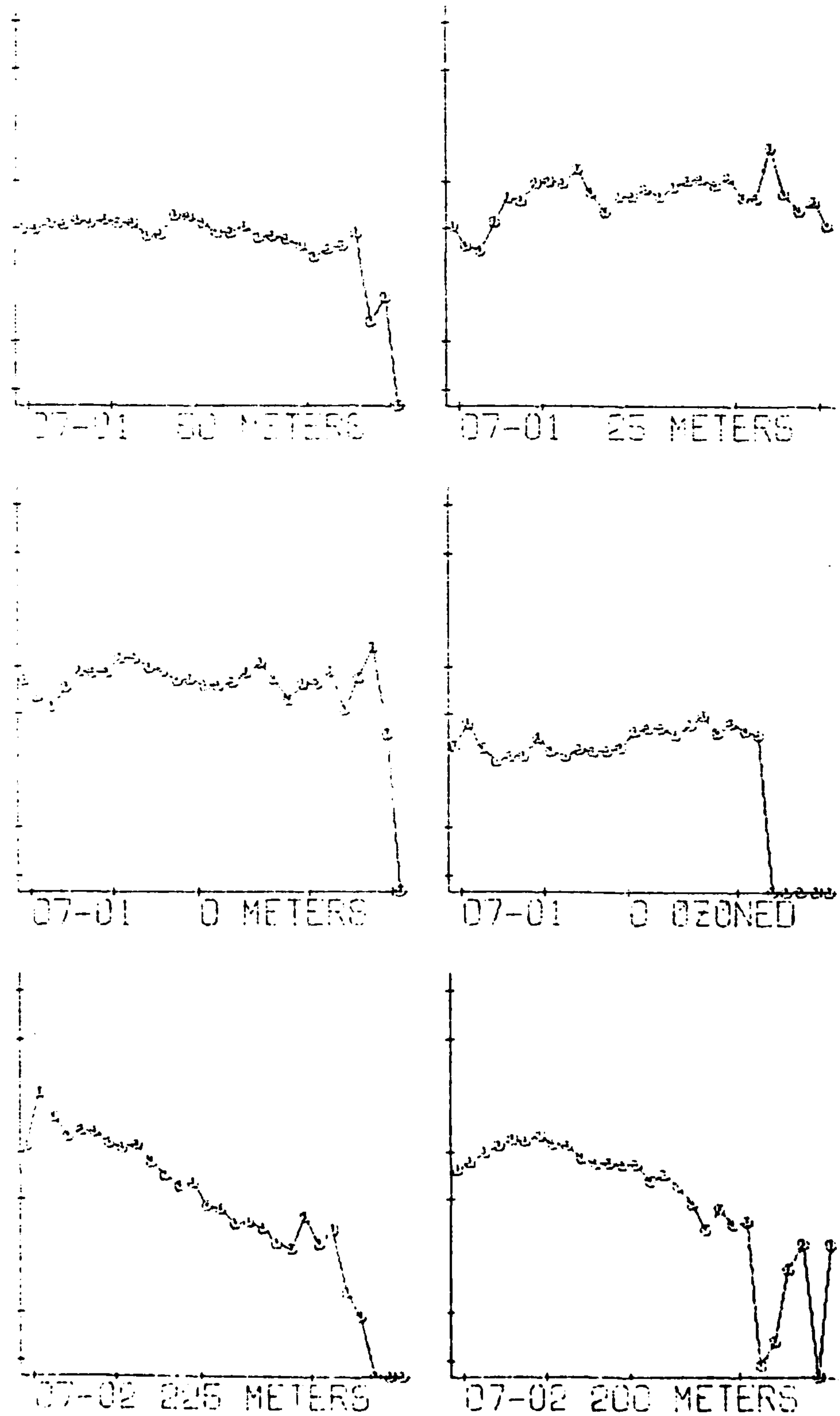
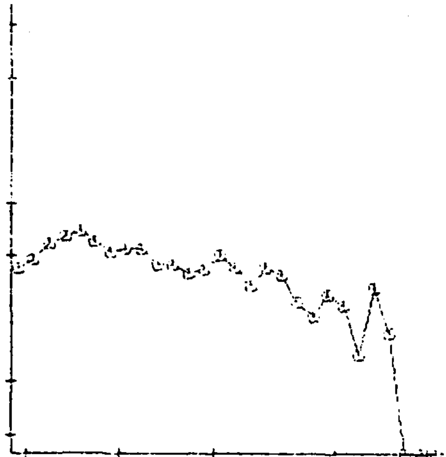


07-01 50 METERS
07-01 25 METERS
07-01 0 METERS
07-01 0 OZONED
07-02 225 METERS
07-02 200 METERS



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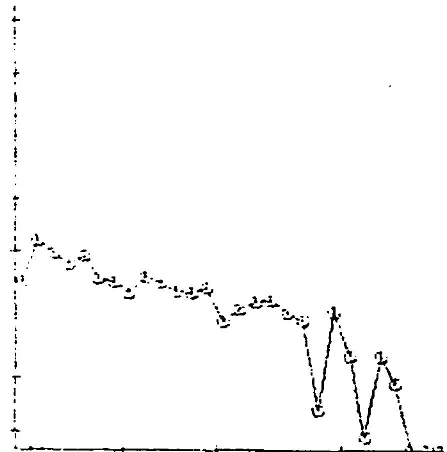

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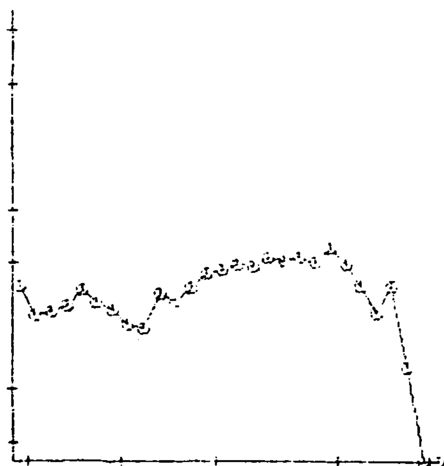

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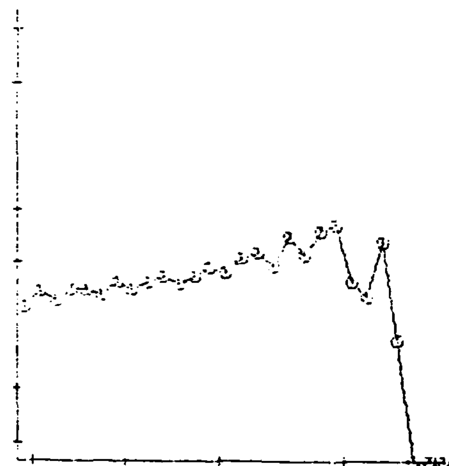
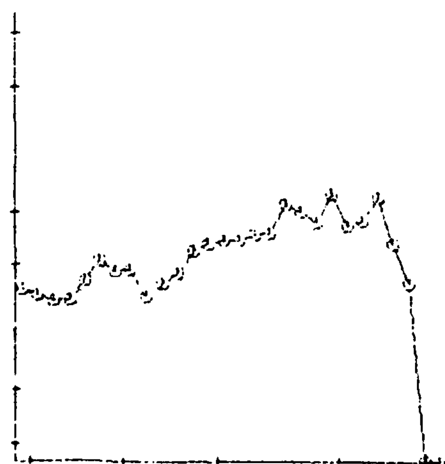


07-02 075 METERS



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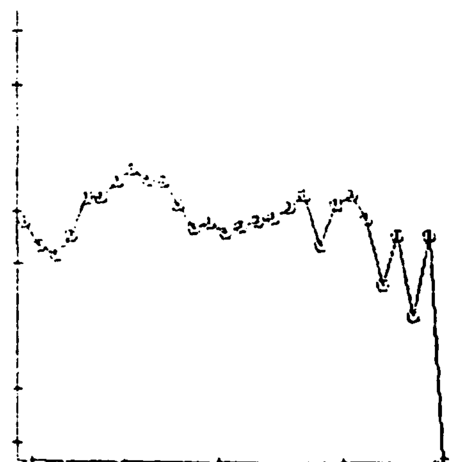

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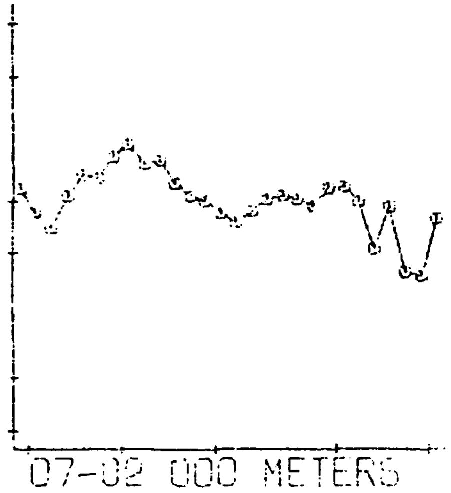
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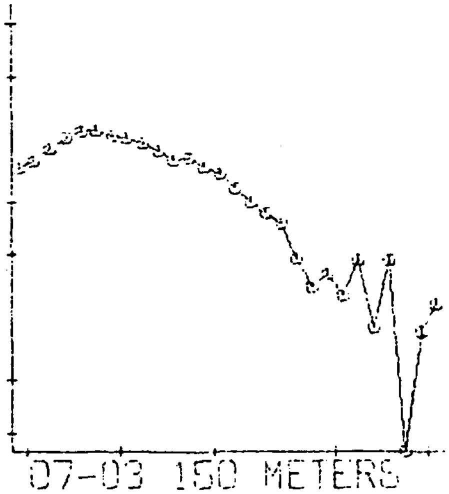
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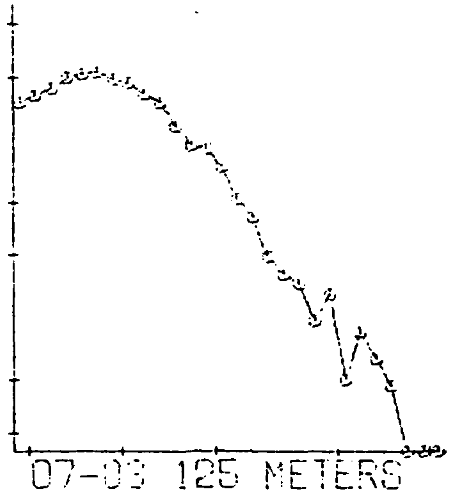
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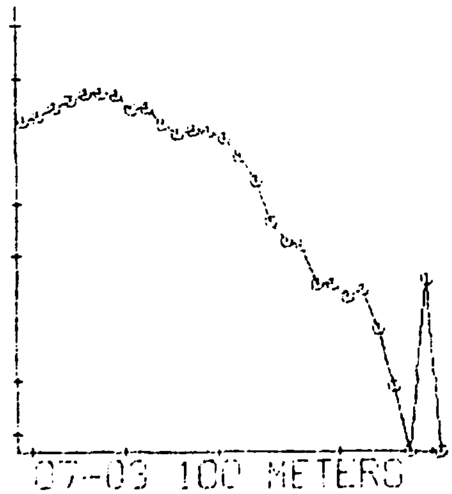
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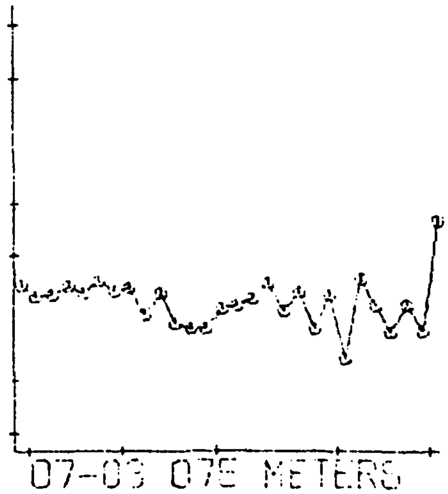
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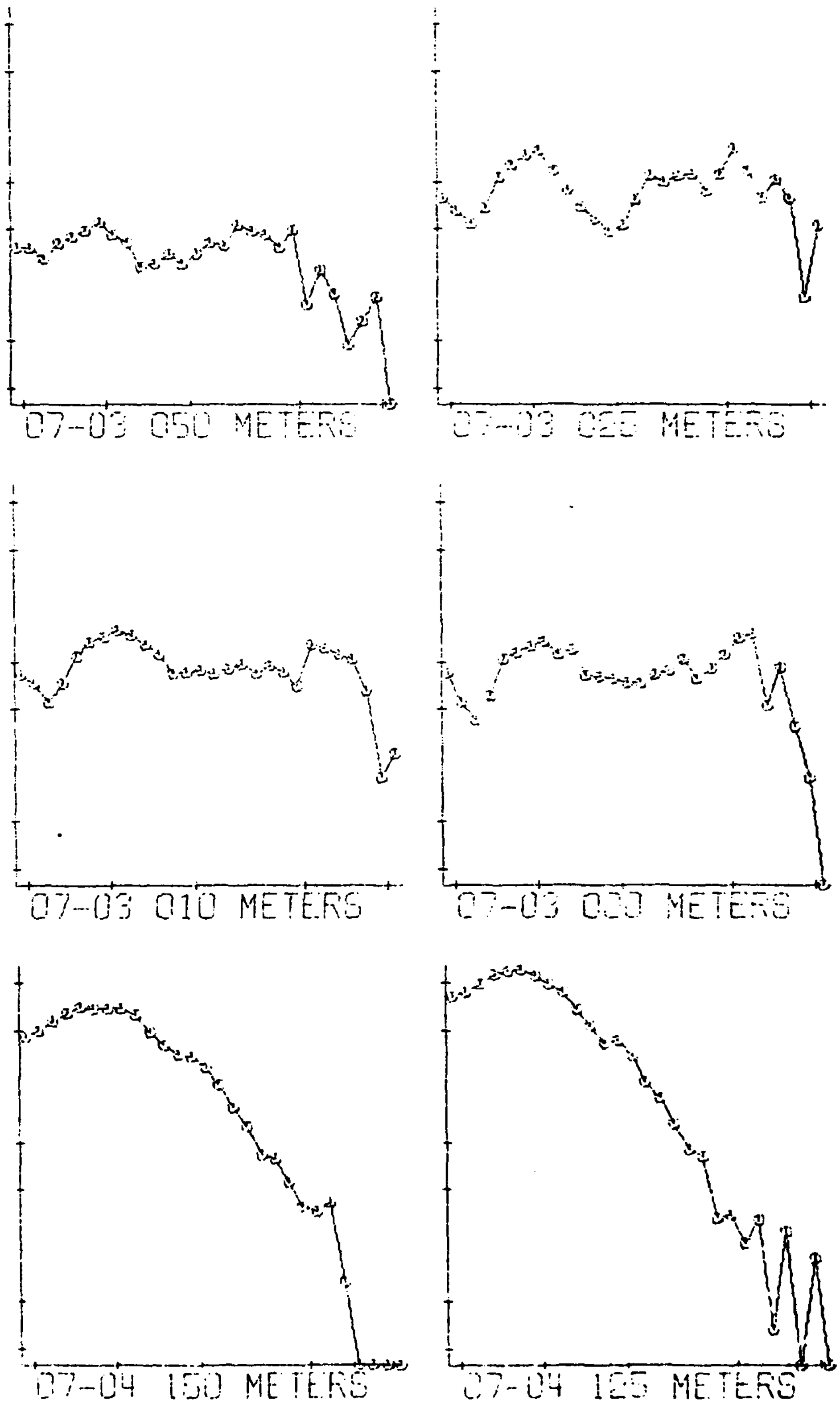
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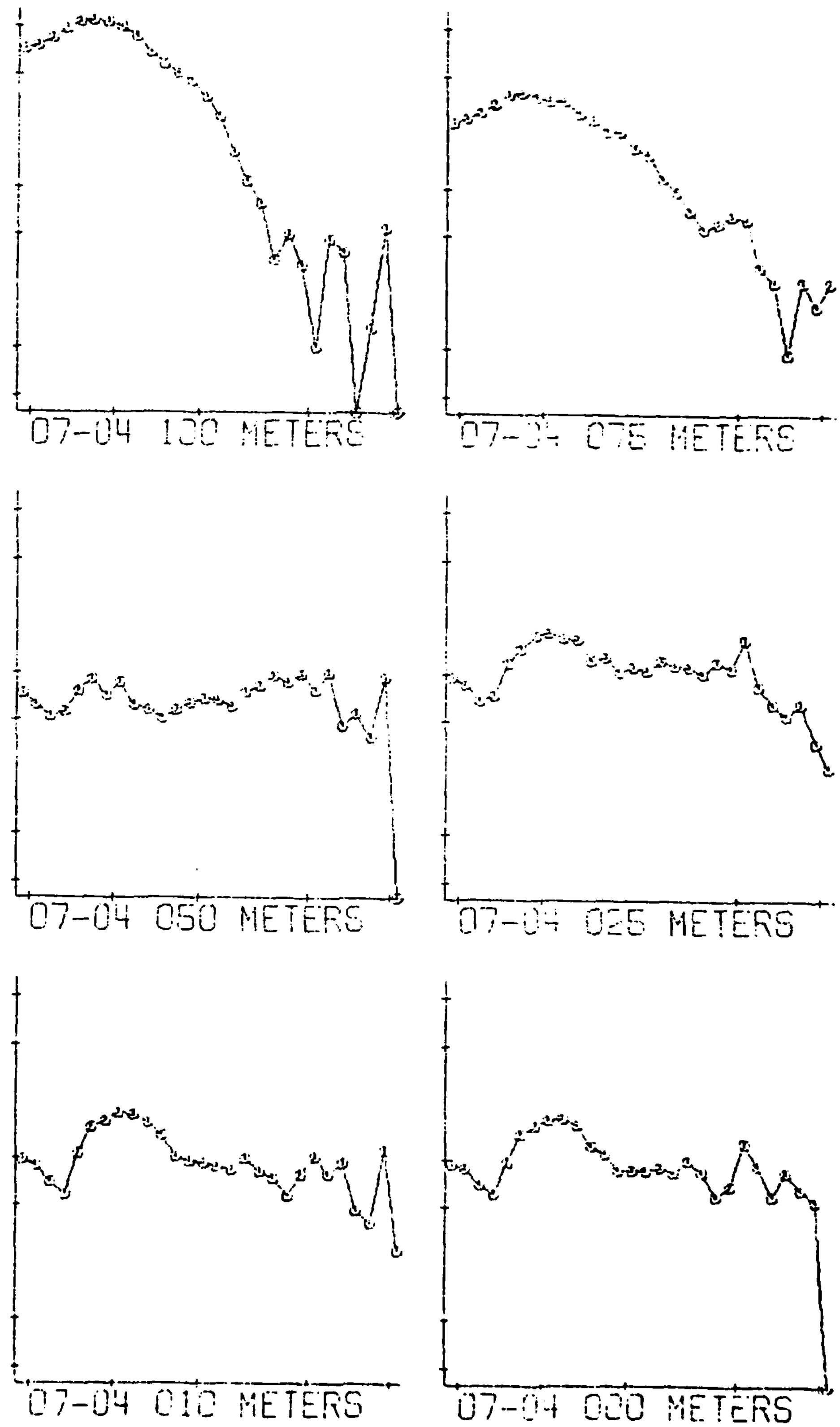
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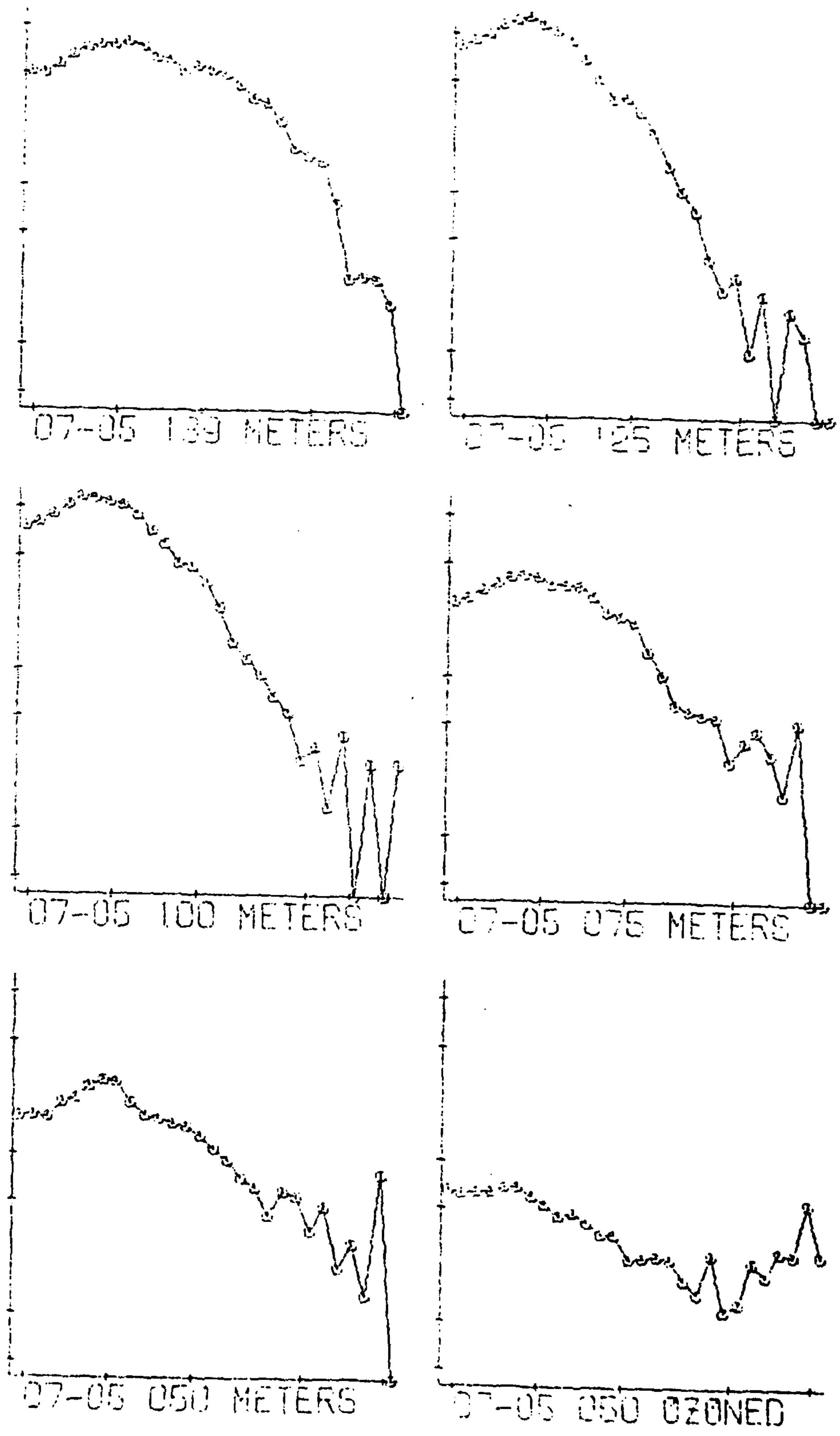

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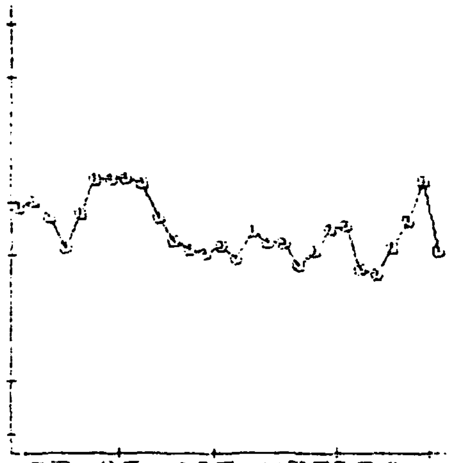

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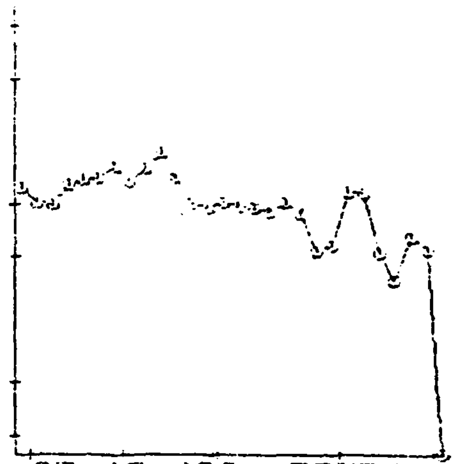

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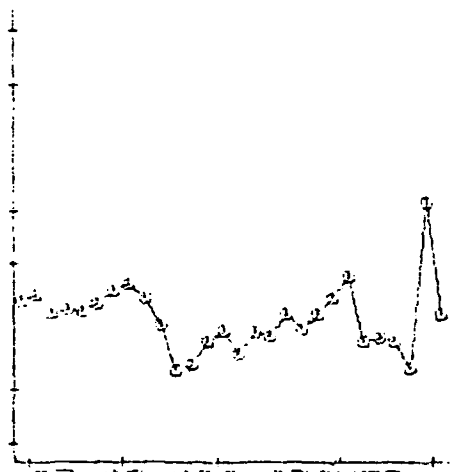

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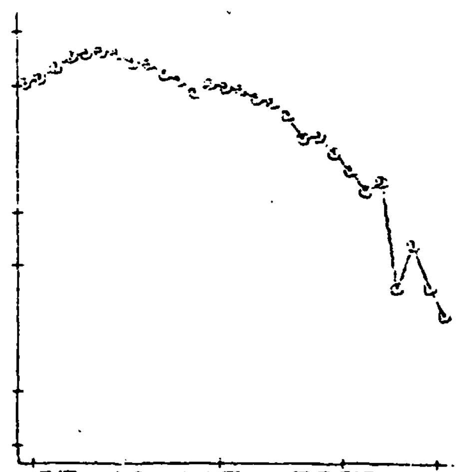

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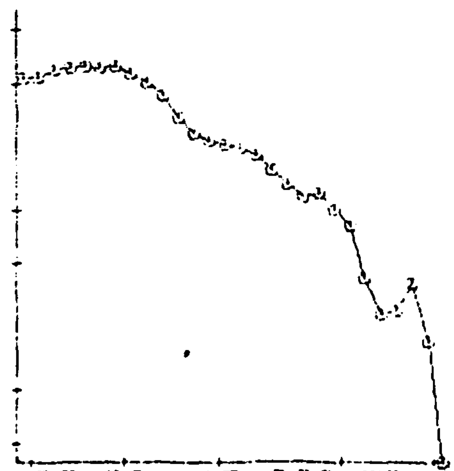

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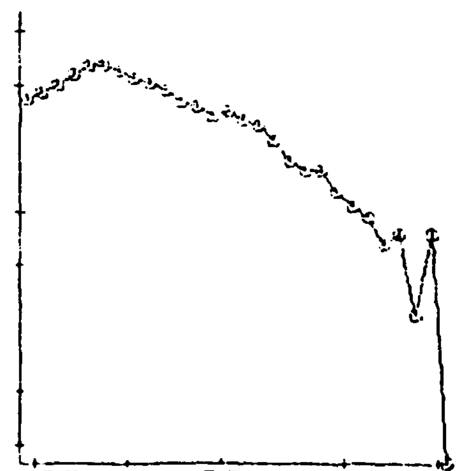

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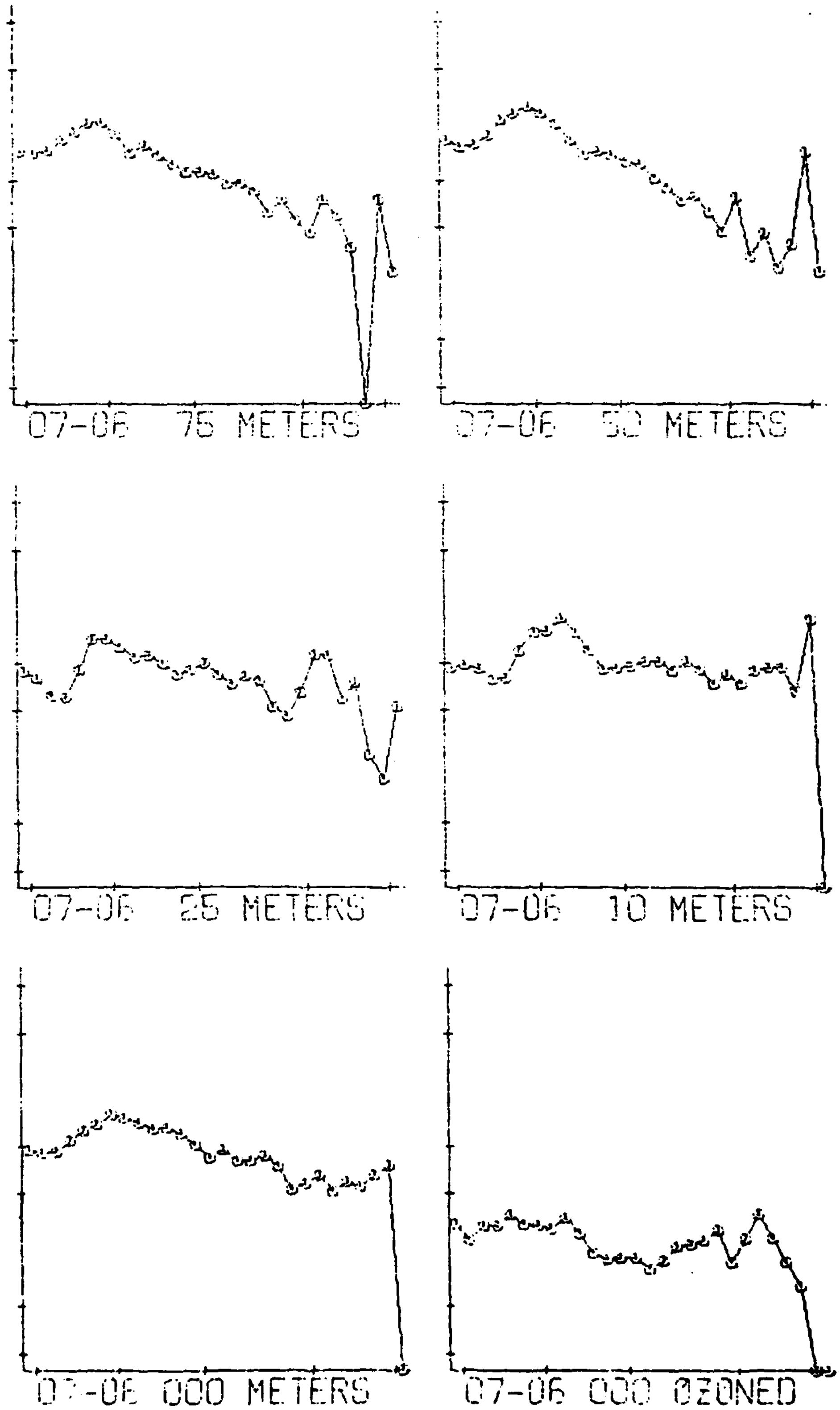
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07-06 25 METERS
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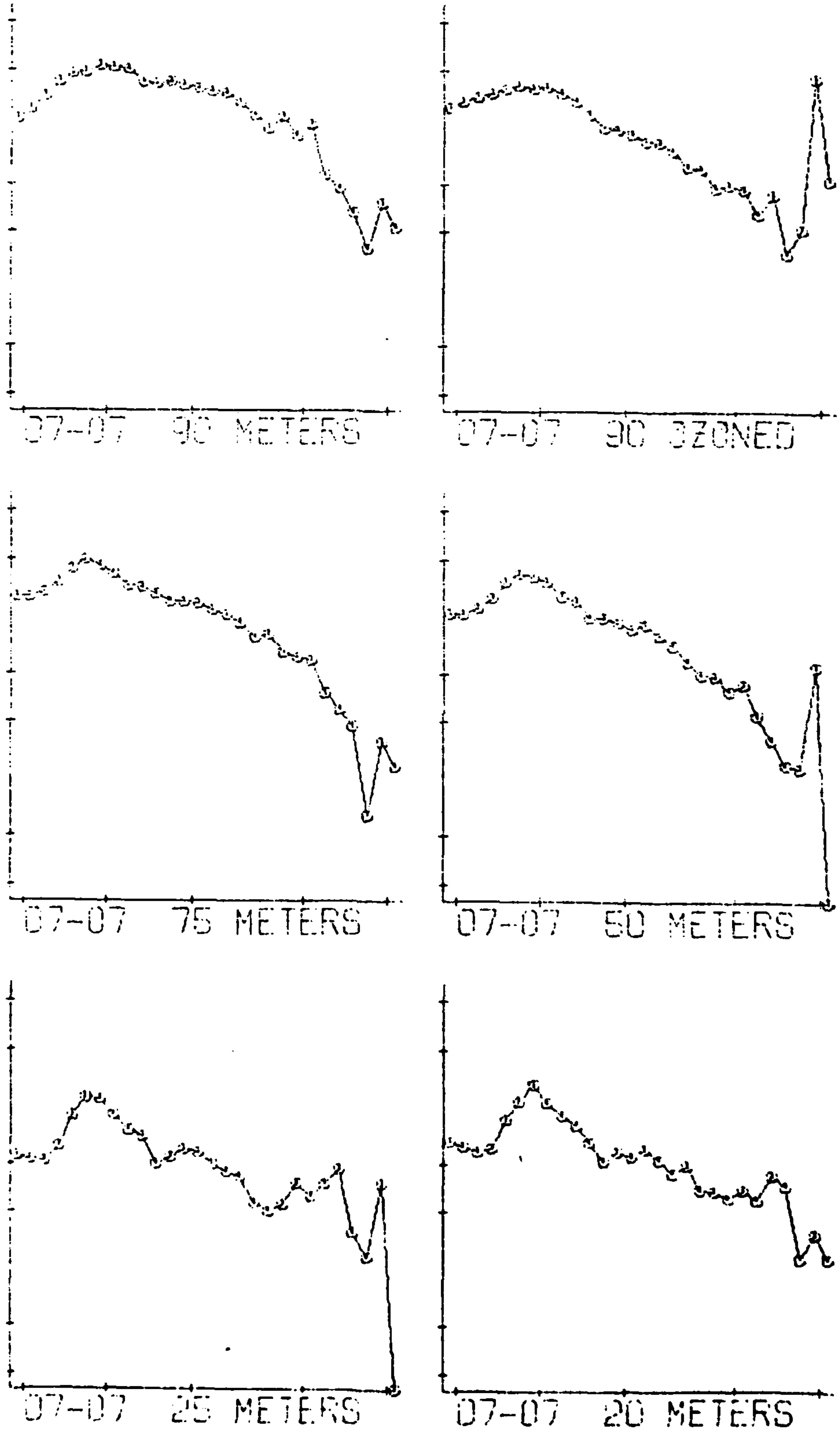
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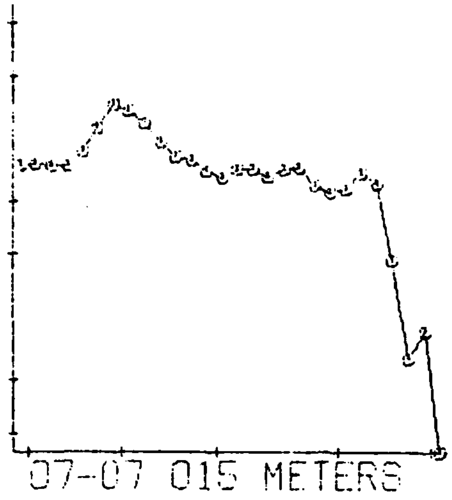
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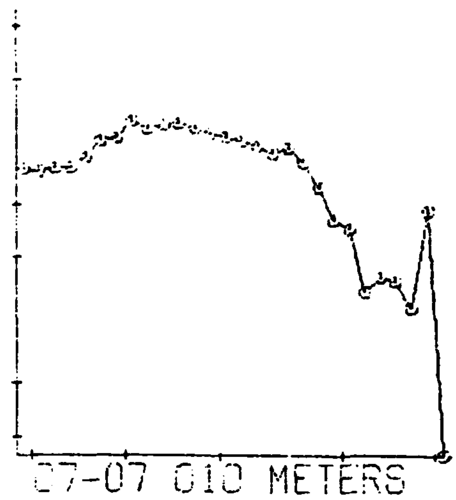
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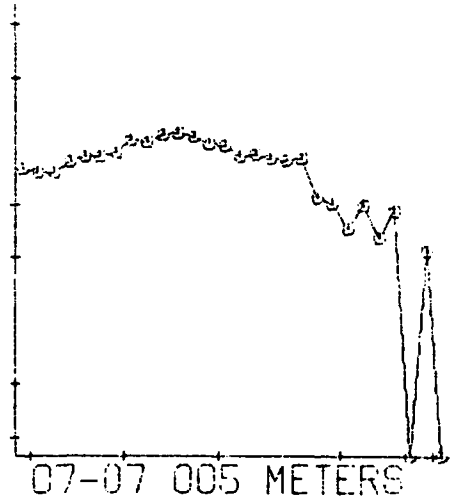
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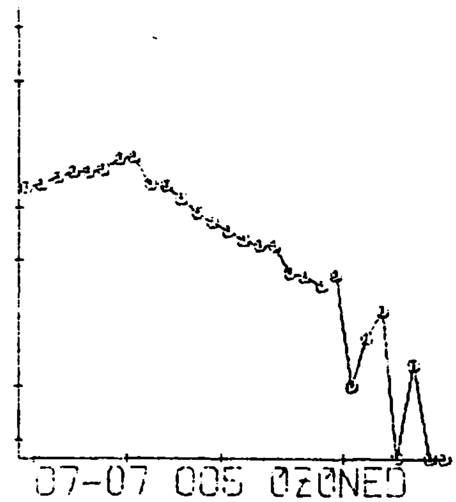
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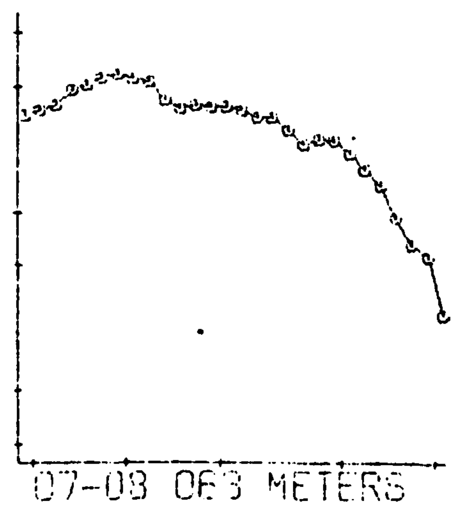
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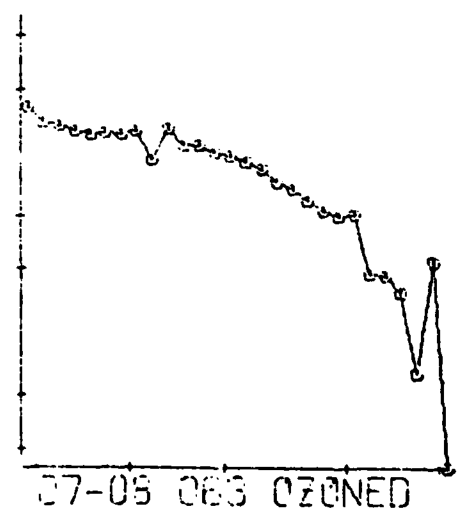
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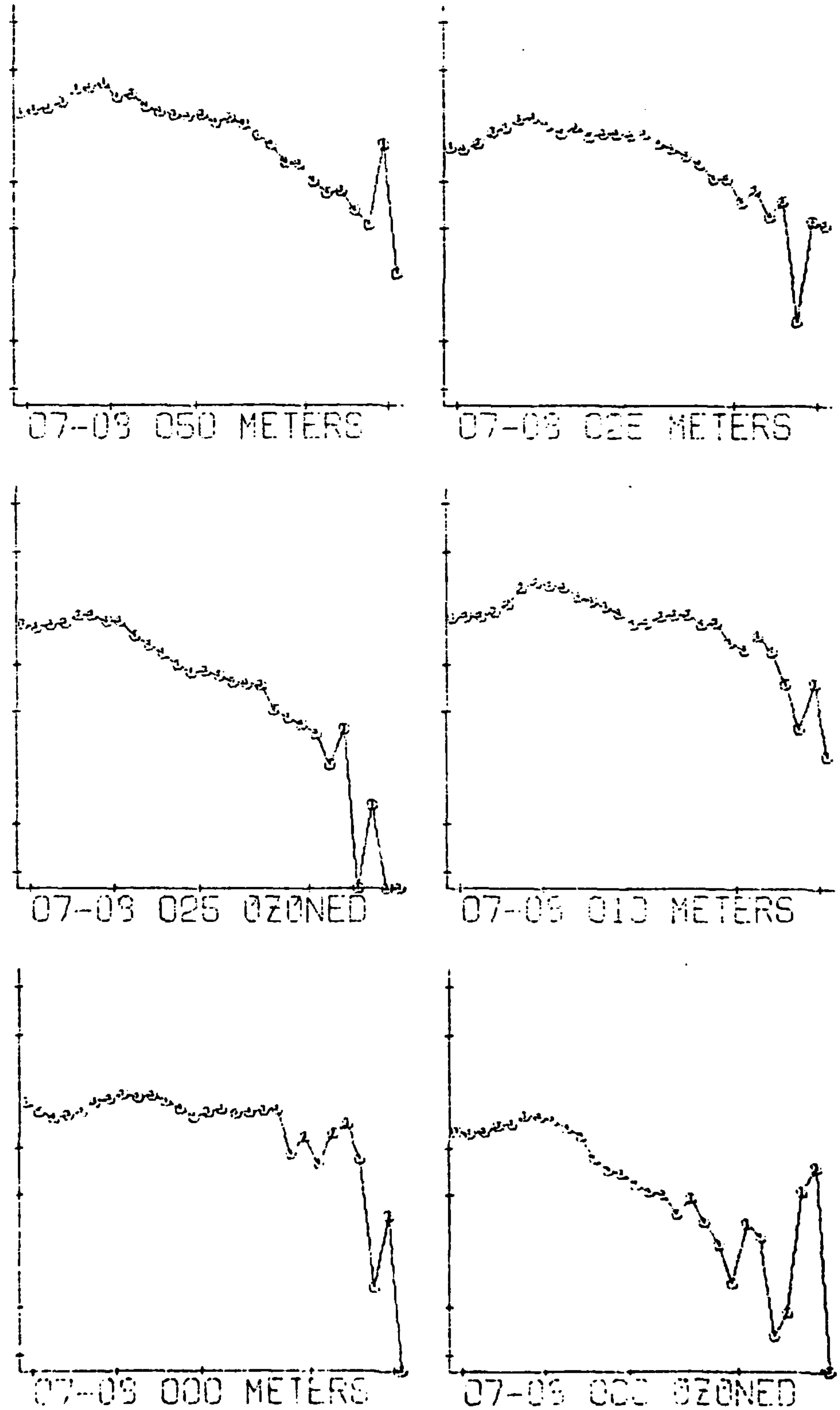
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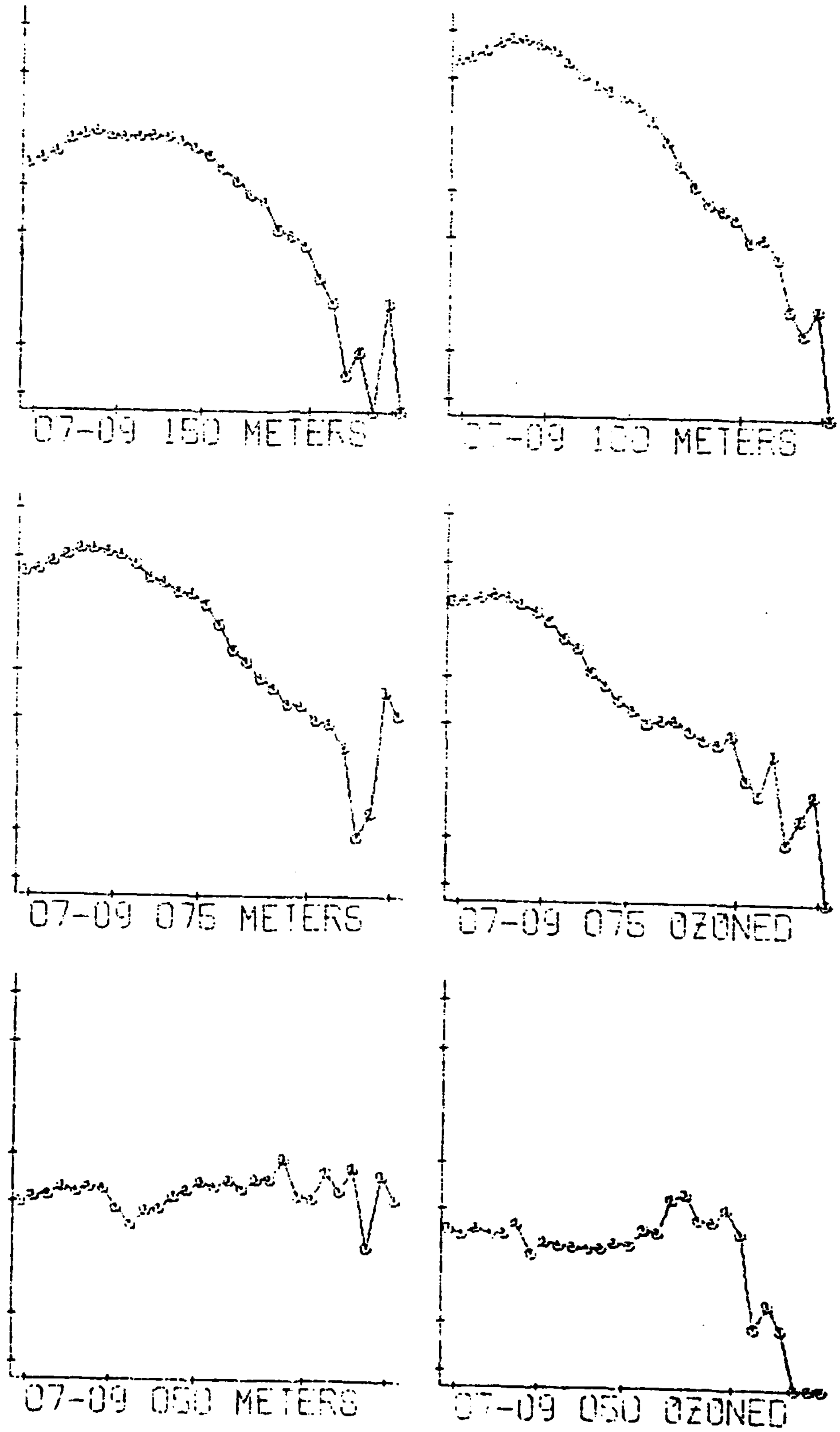
07-09 000 OZONED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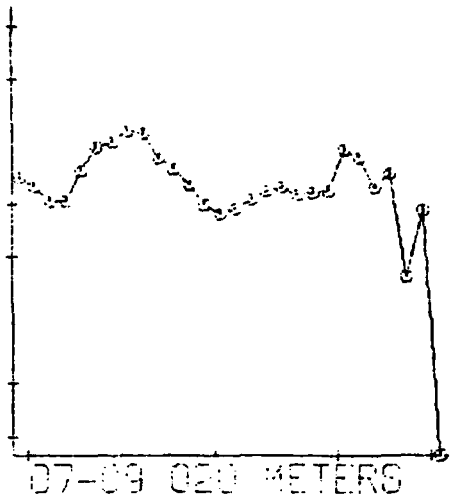
07-09 050 OZONED


07-09 030 METERS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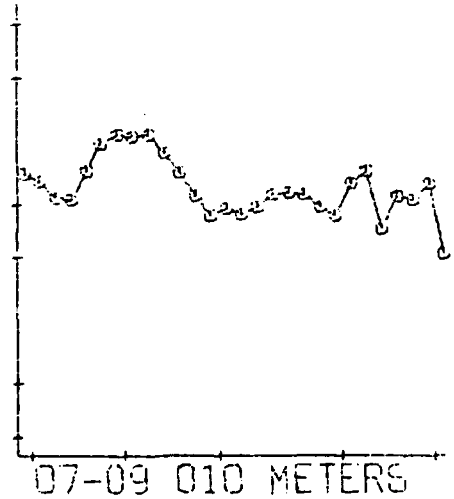
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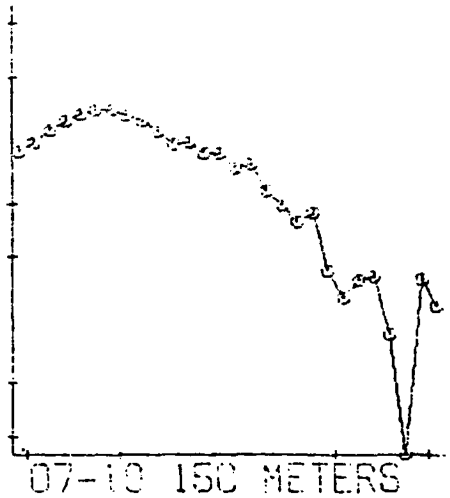
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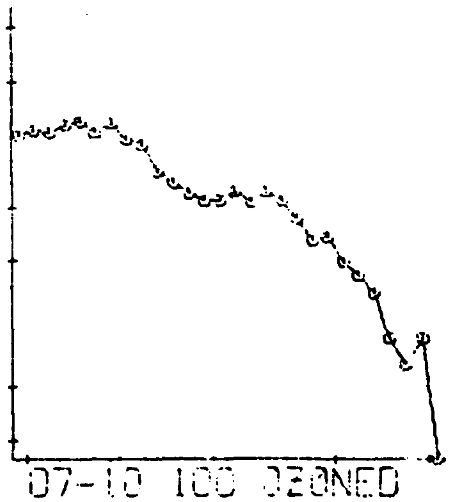
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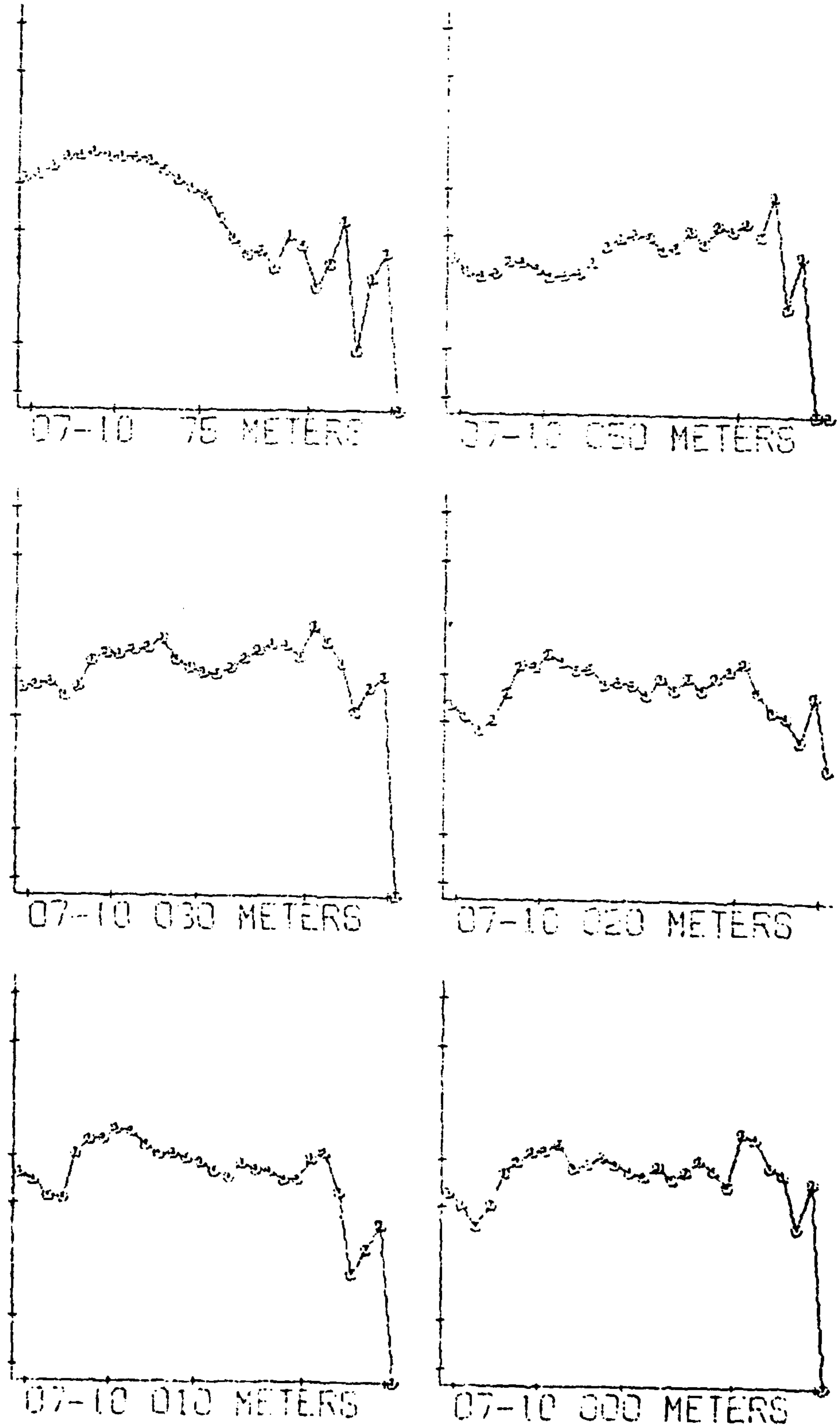
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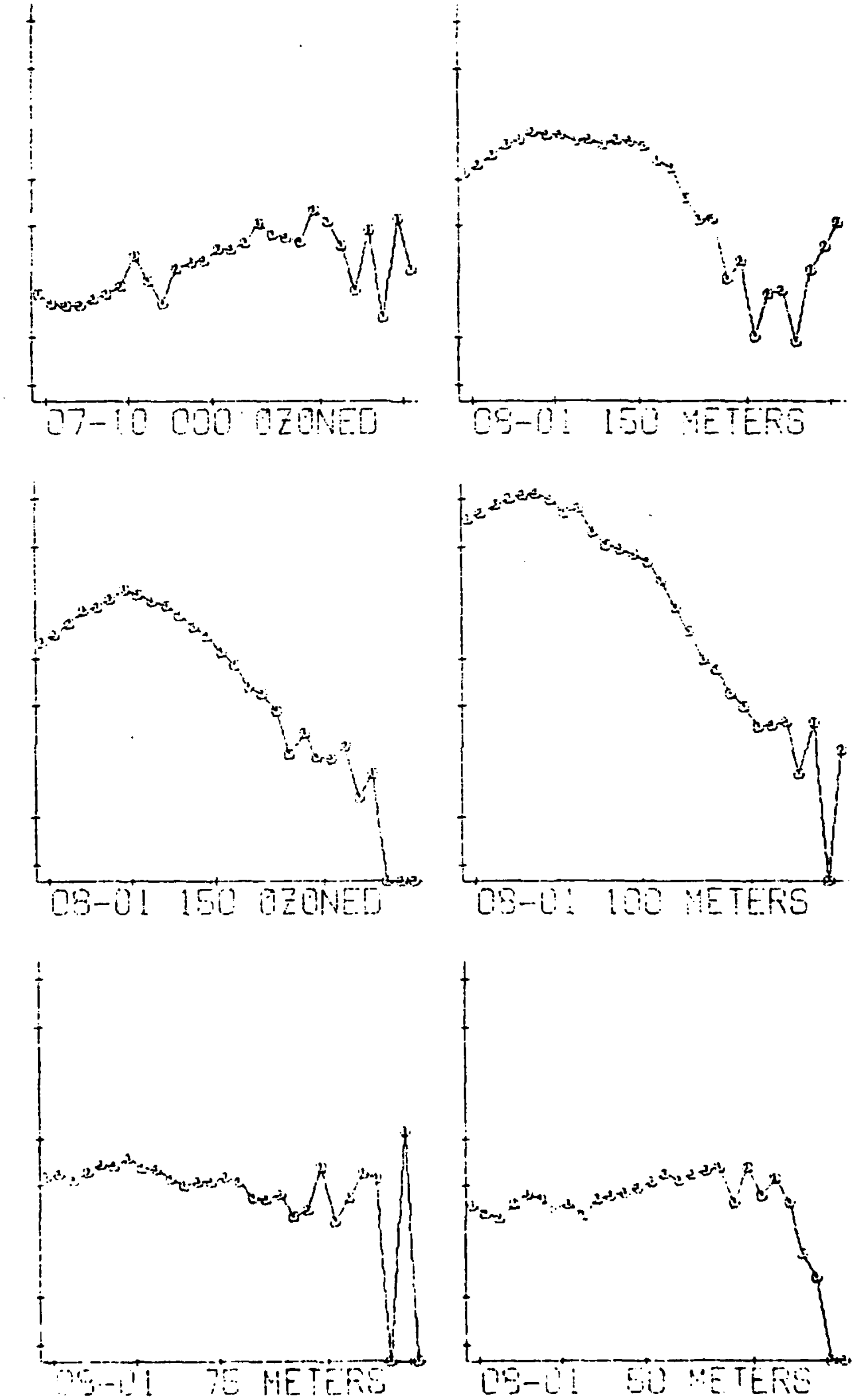
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08-01 150 METERS
08-01 150 OZONED
08-01 100 METERS
08-01 75 METERS
08-01 50 METERS

AD-A092 988 OREGON STATE UNIV CORVALLIS SCHOOL OF OCEANOGRAPHY F/G 8/10
HYDROGRAPHIC, OPTICAL, AND BIOLOGICAL OBSERVATIONS ON THE CENTR--ETC(U)
APR 80 D W MENZIES, J C KITCHEN, S MOORE N00014-76-C-0067
UNCLASSIFIED DATA-81 NL

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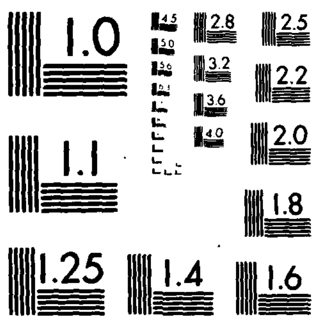
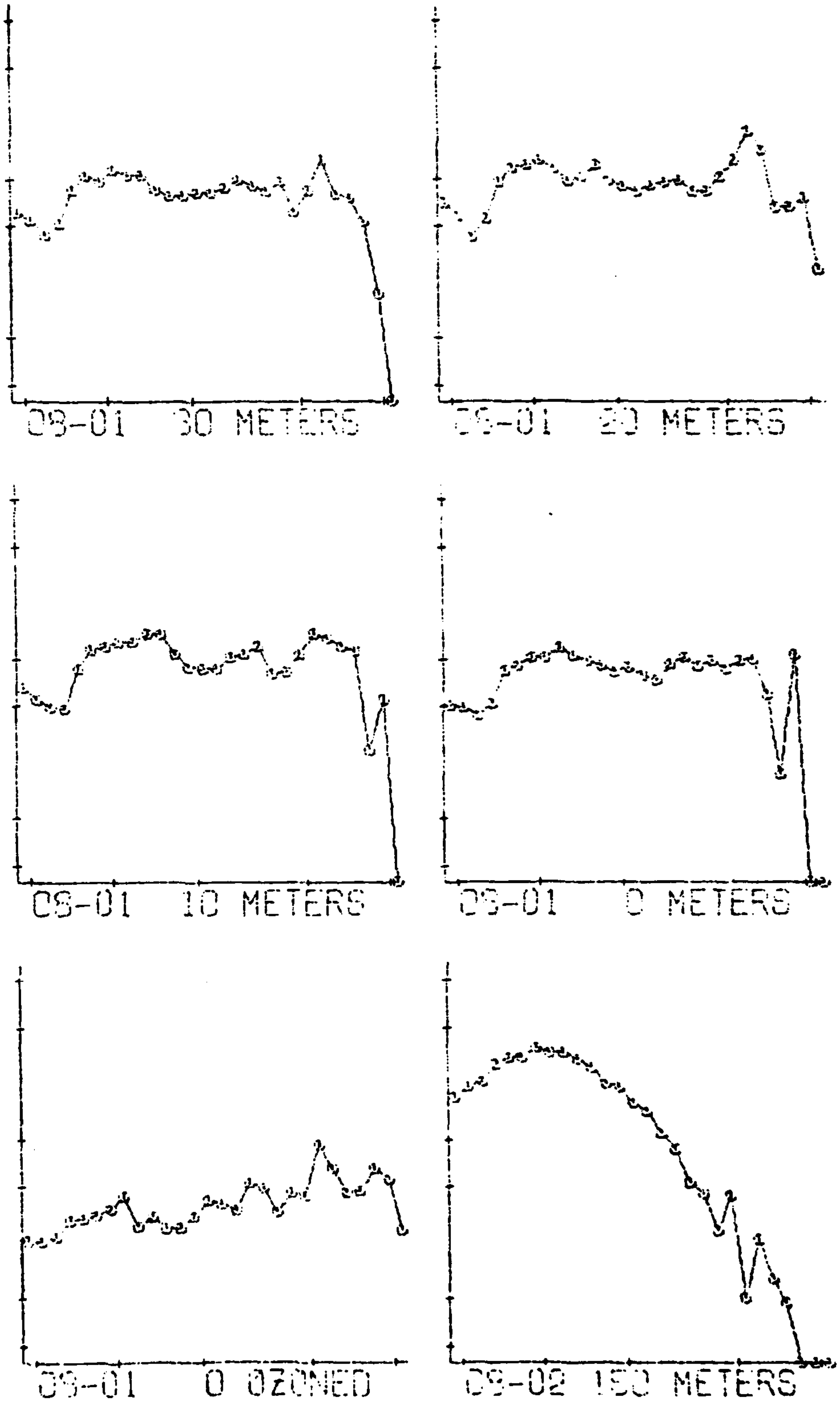


MICROCOPY RESOLUTION TEST CHART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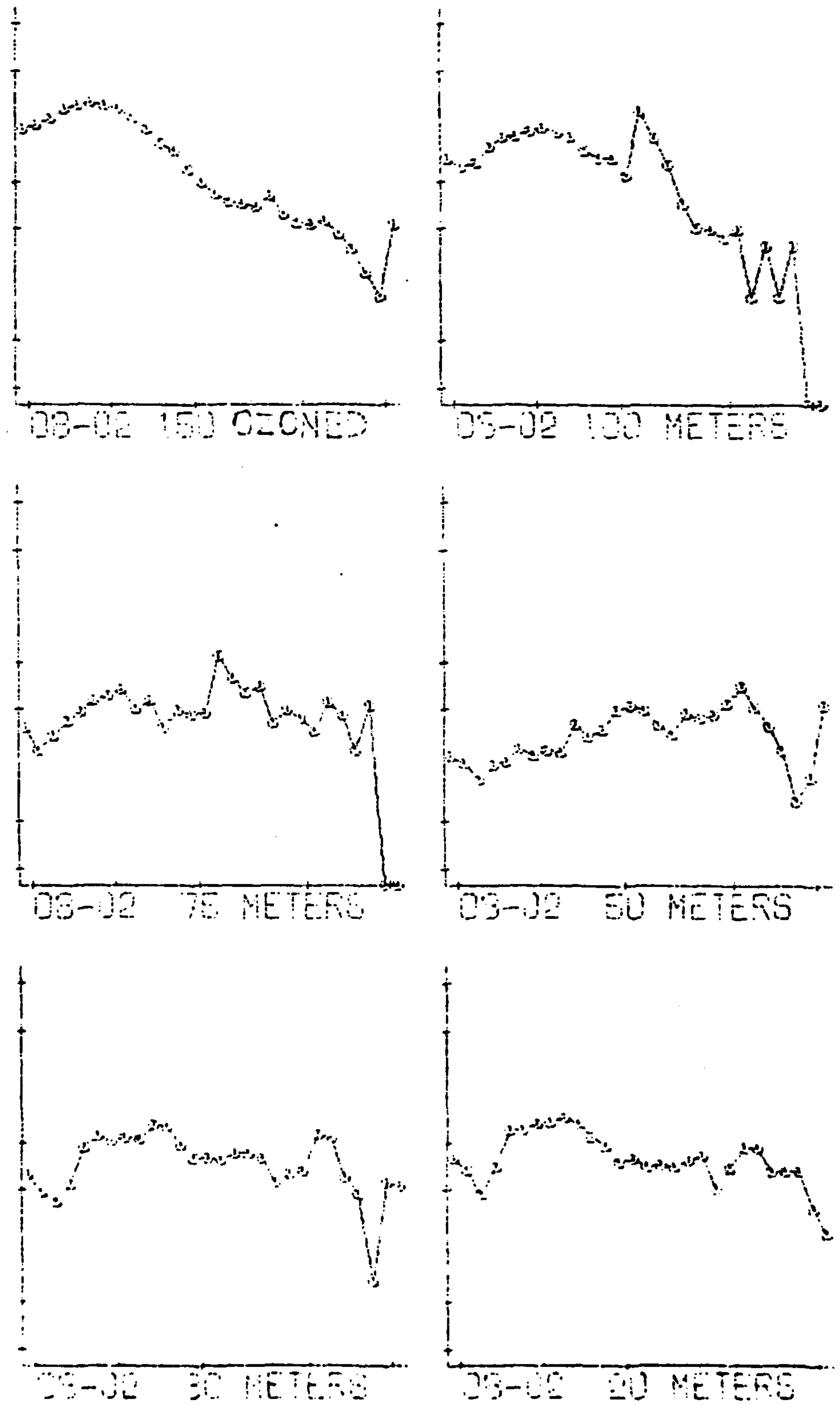
CS-01 0 OZONED
CS-02 150 METERS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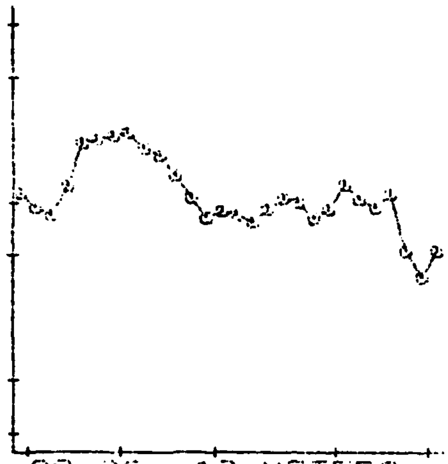
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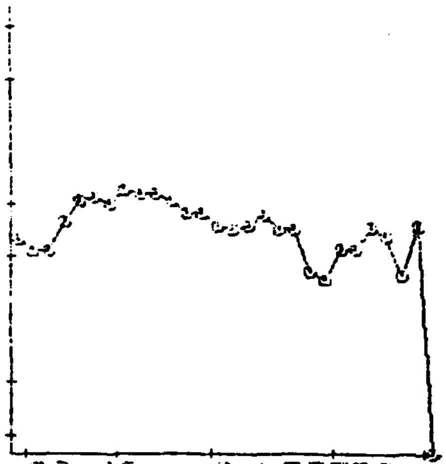
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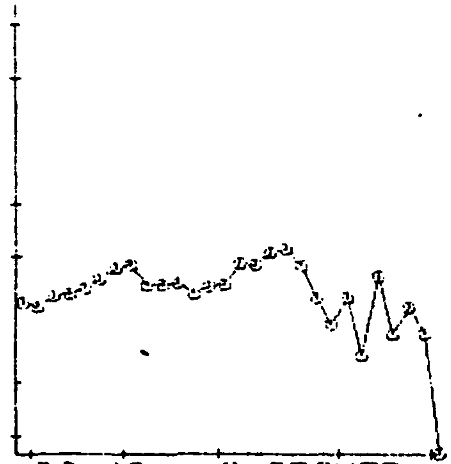
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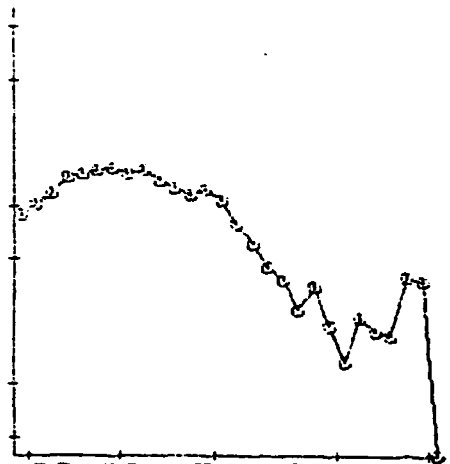
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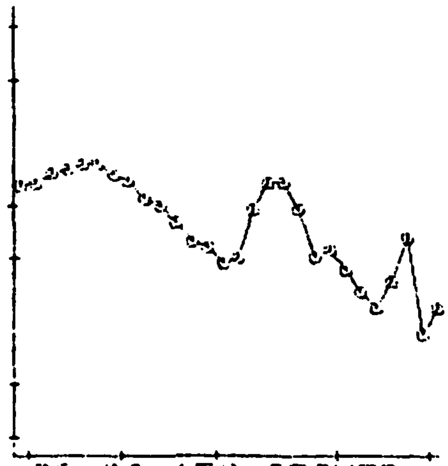
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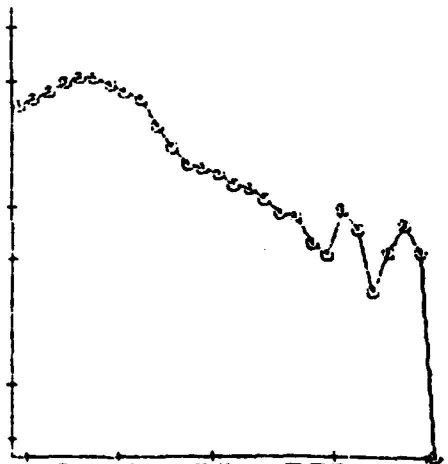
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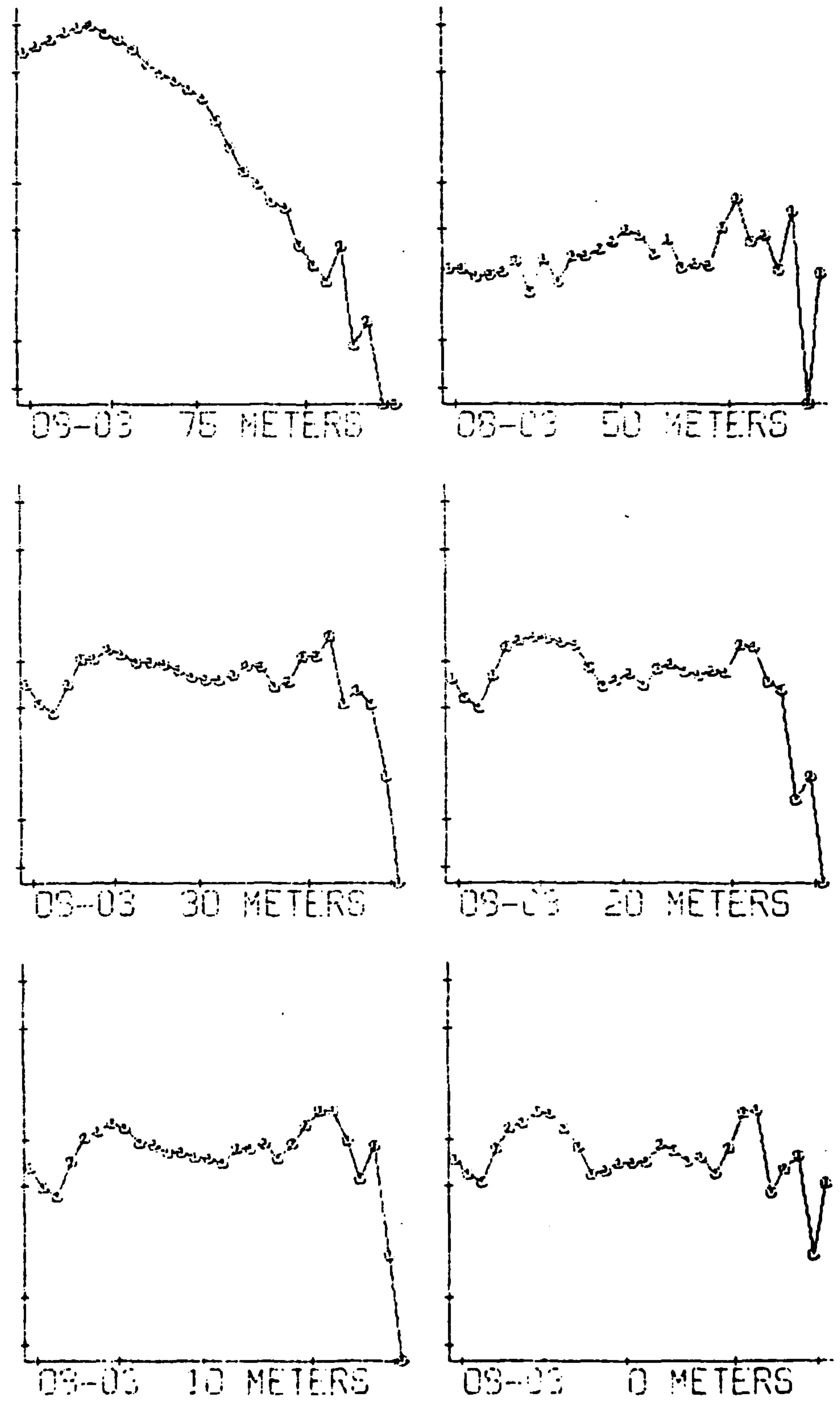
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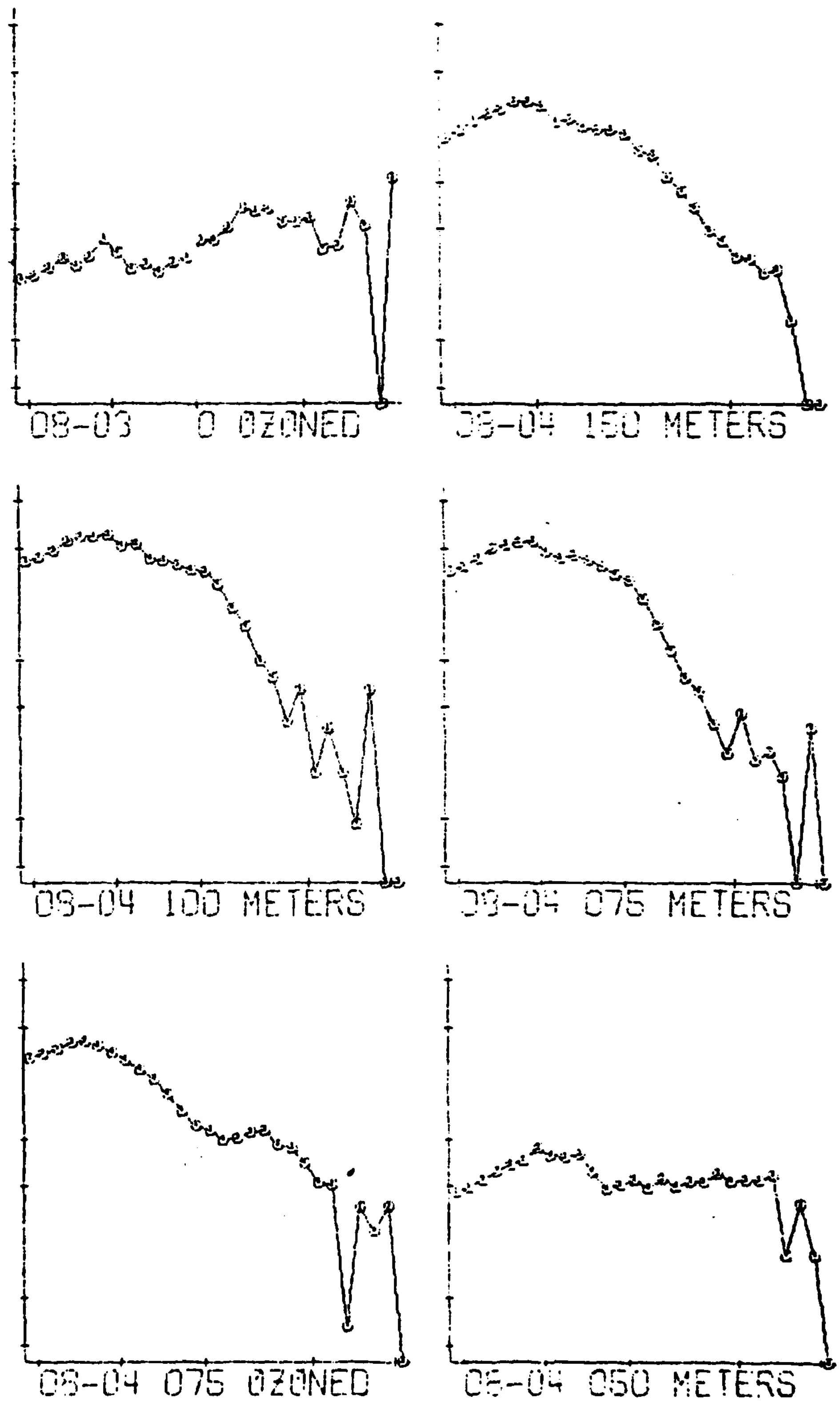
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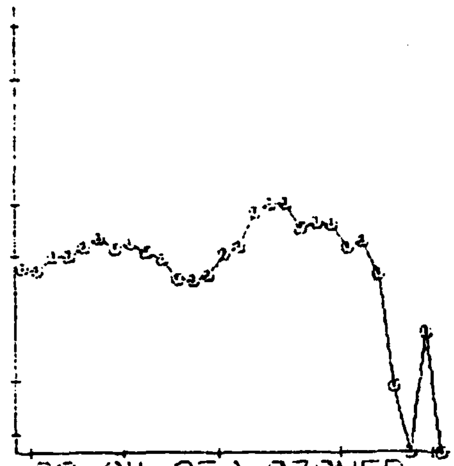

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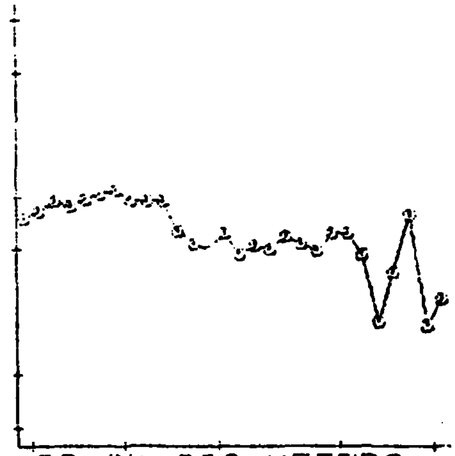

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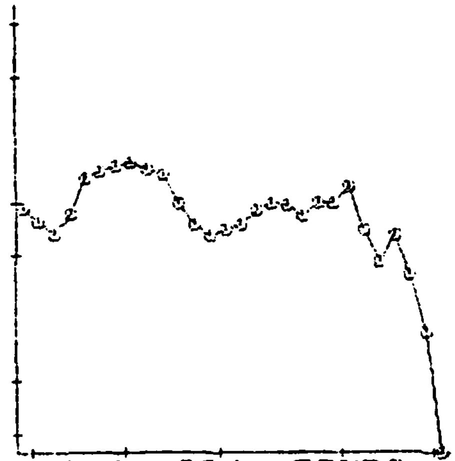

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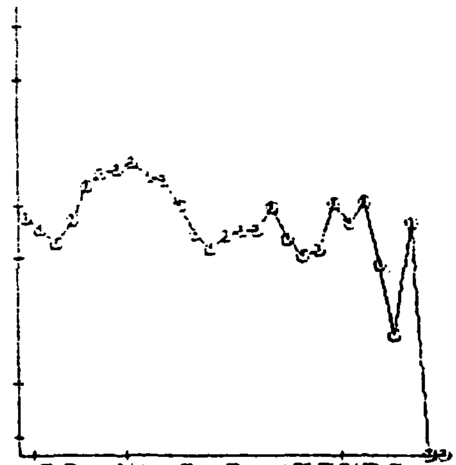

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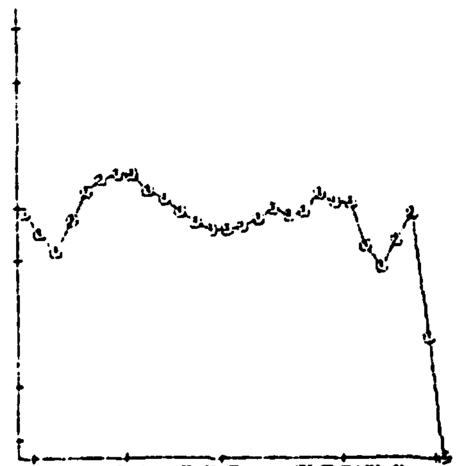

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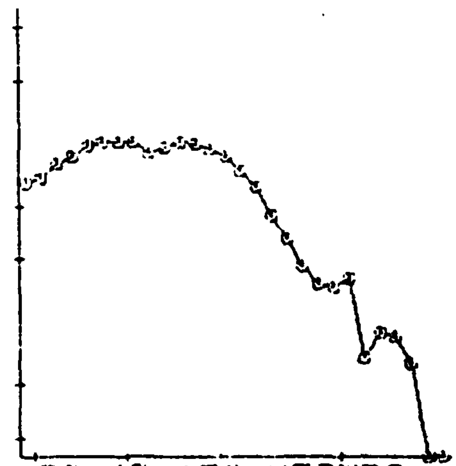

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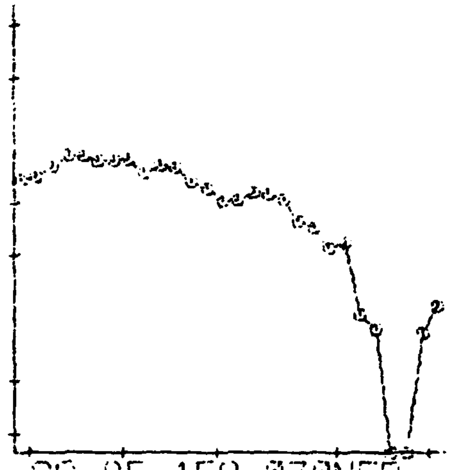

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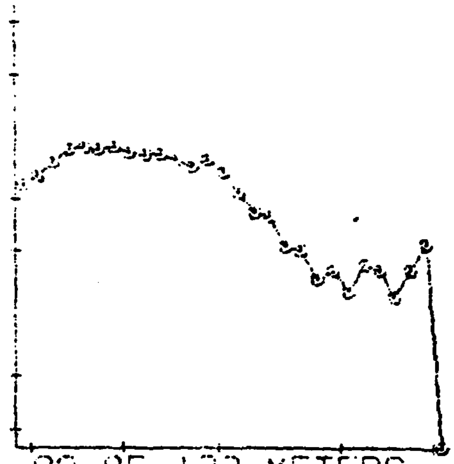

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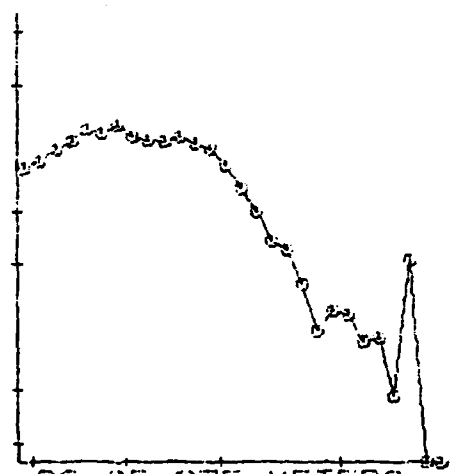

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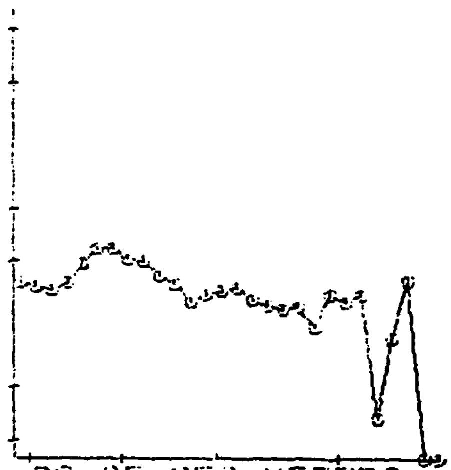

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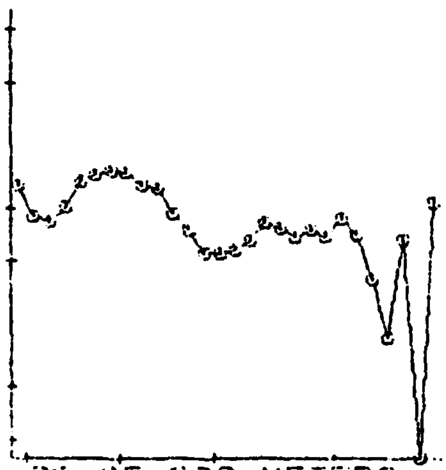

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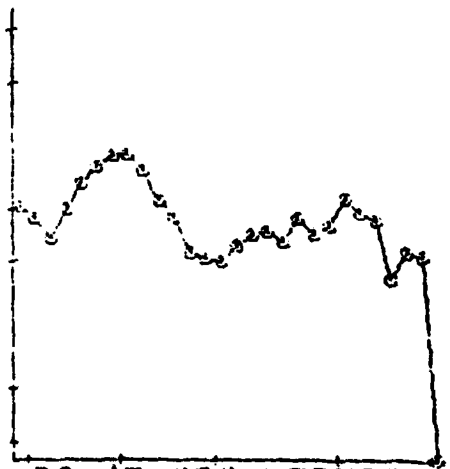

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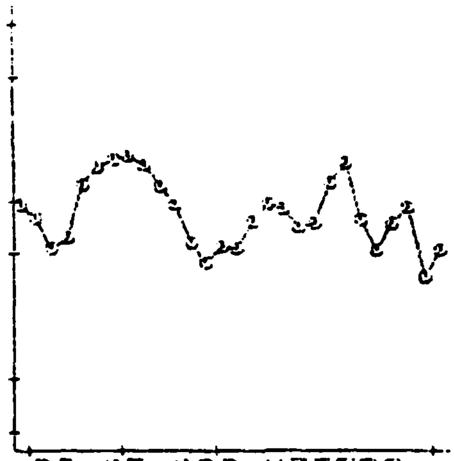

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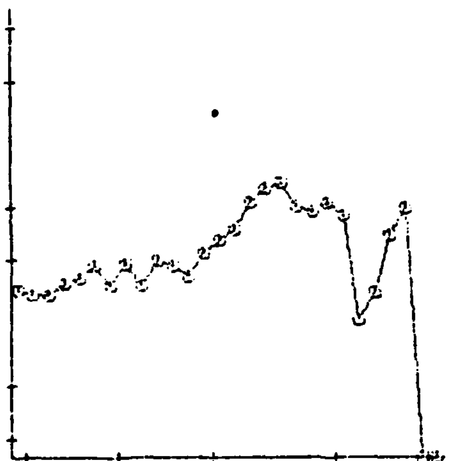

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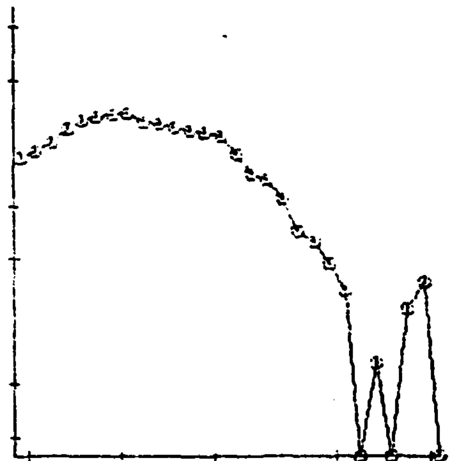

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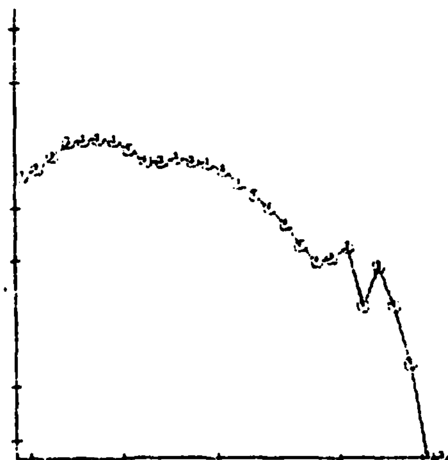

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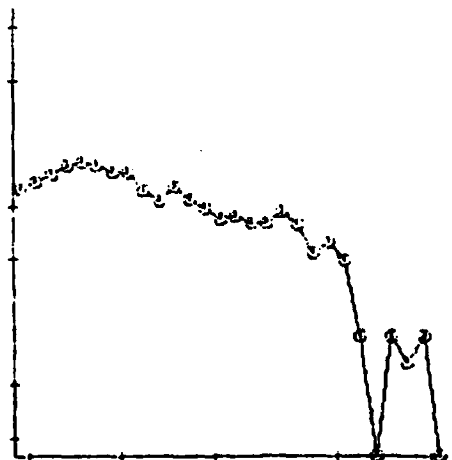

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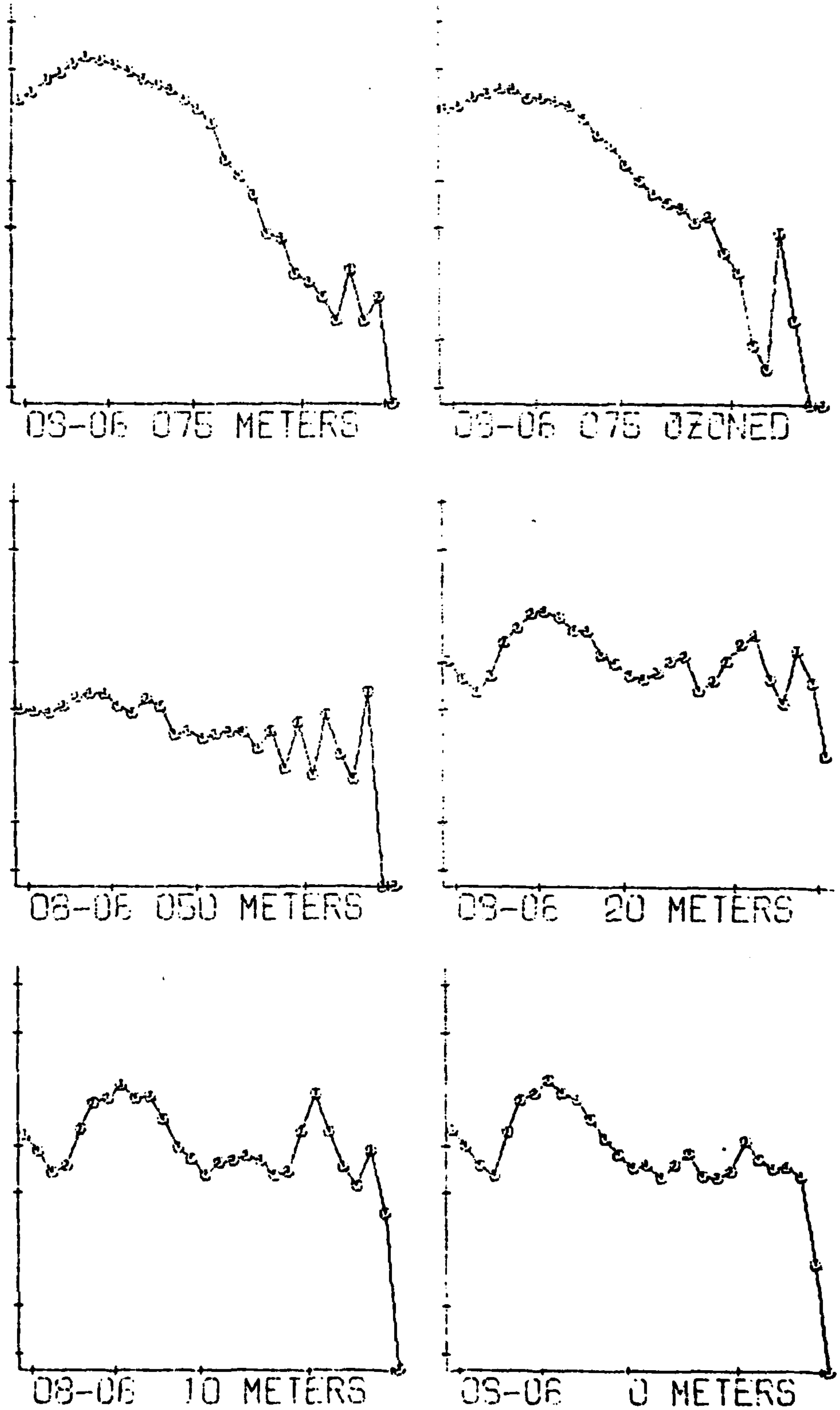
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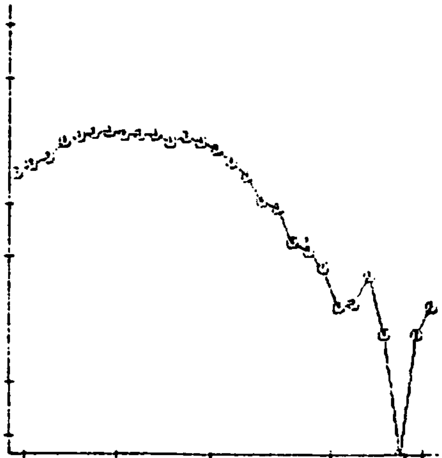

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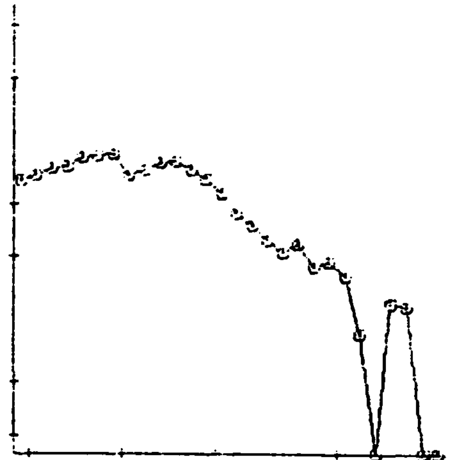

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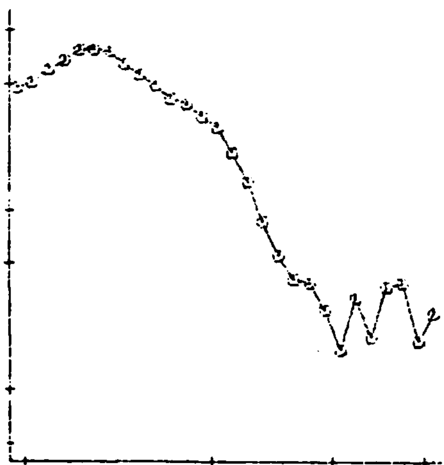

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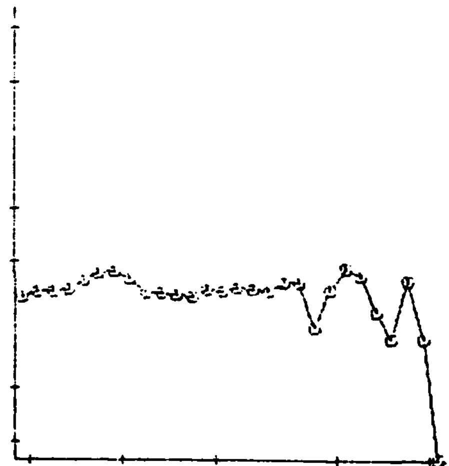

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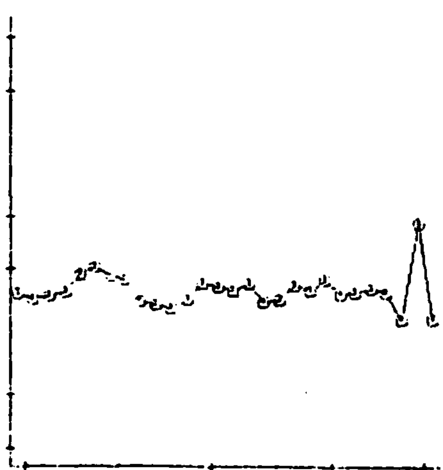

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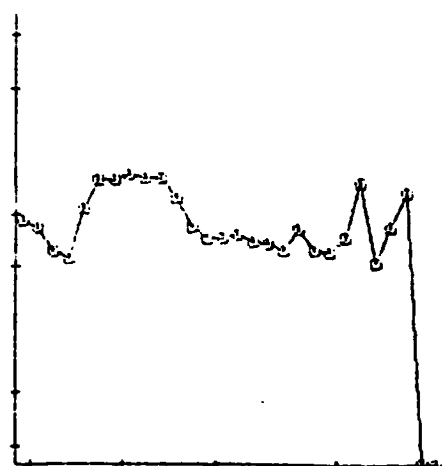

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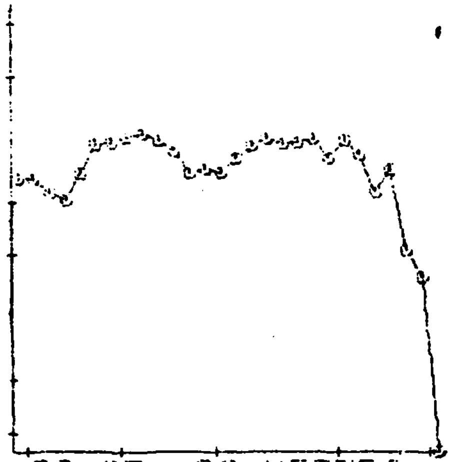
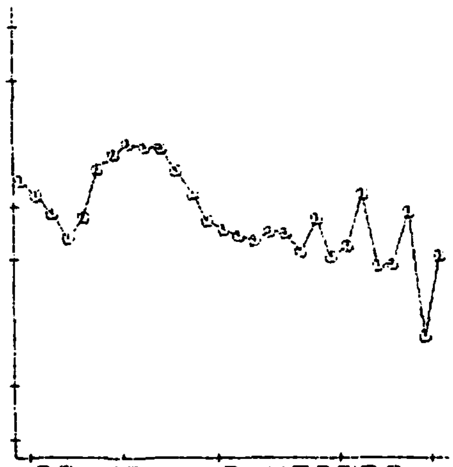
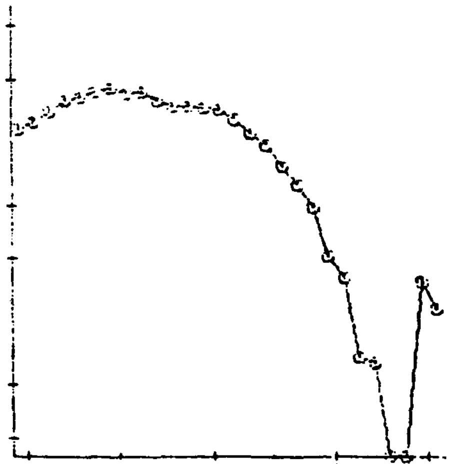
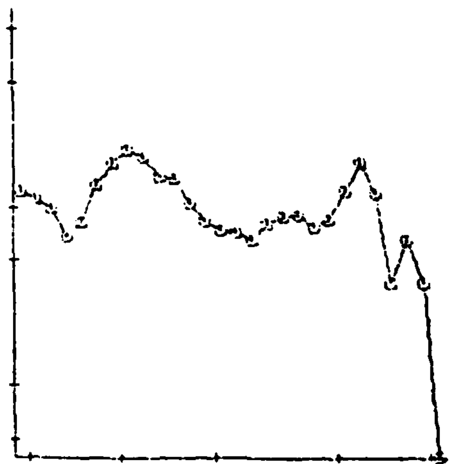

08-07 20 METERS

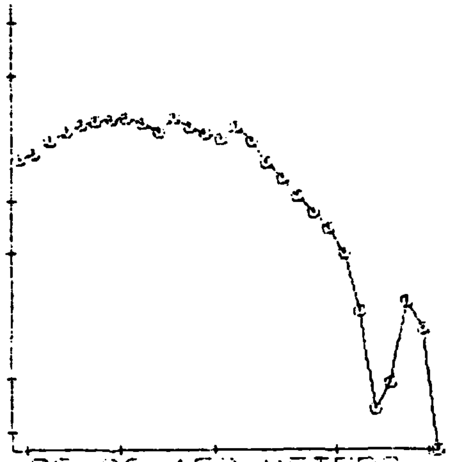

08-07 10 METERS


08-07 0 METERS


08-08 150 METERS


08-09 100 METERS


08-08 000 METERS



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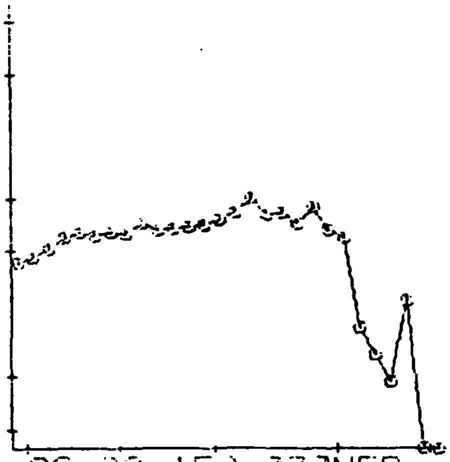
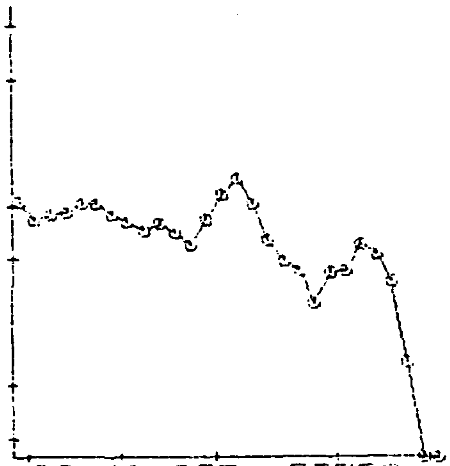
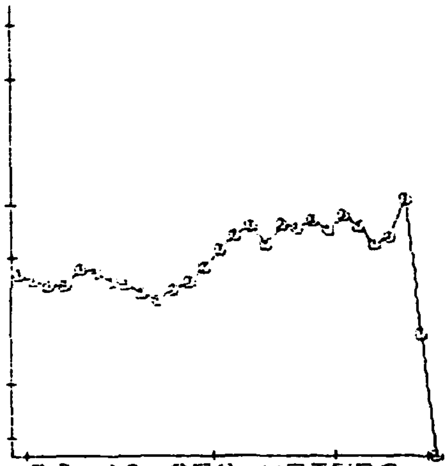


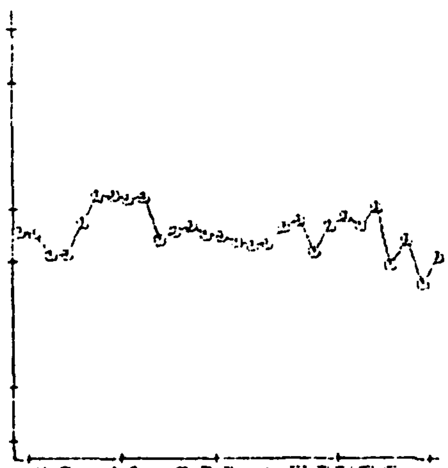
08-09 150 OZONED



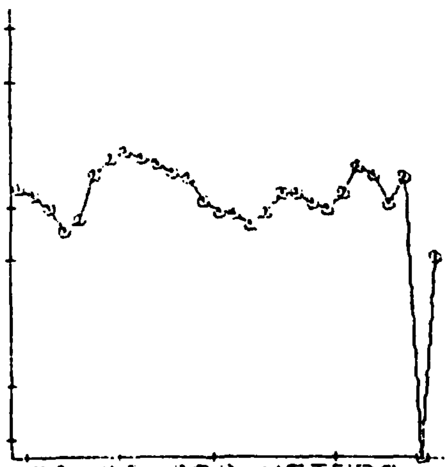
08-09 075 METERS



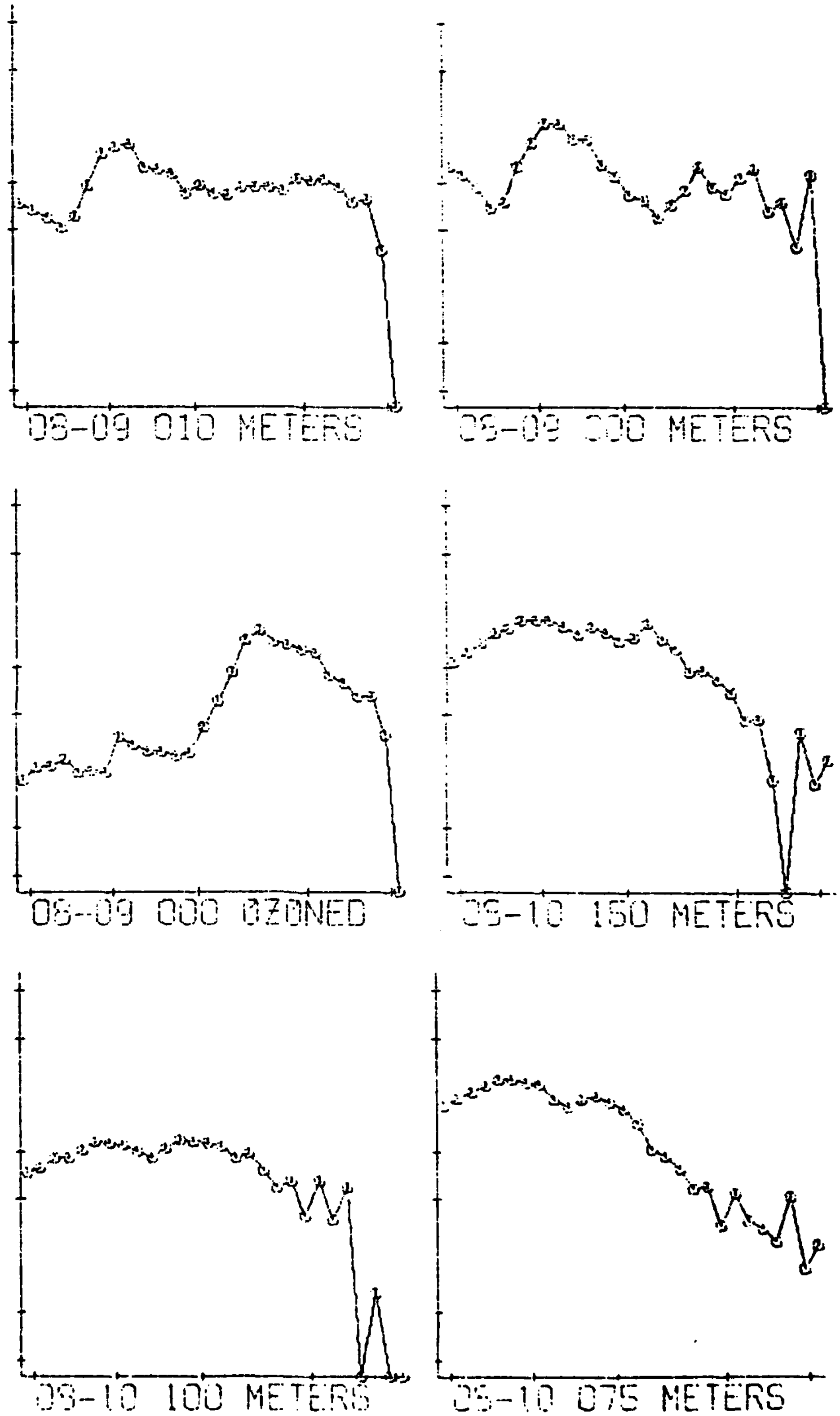
08-09 050 METERS



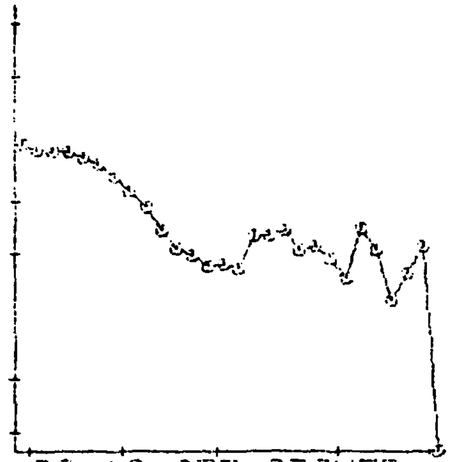
08-09 030 METERS



08-09 020 METERS



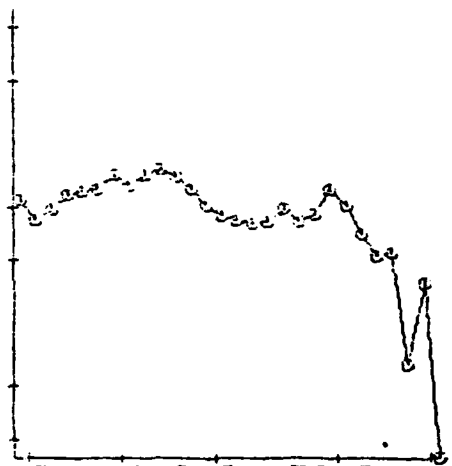
OS-09 010 METERS
OS-09 000 METERS
OS-09 000 OZONED
OS-10 150 METERS
OS-10 100 METERS
OS-10 075 METERS



09-10 075 OZONED

09-10 050 METERS

09-10 050 OZONED



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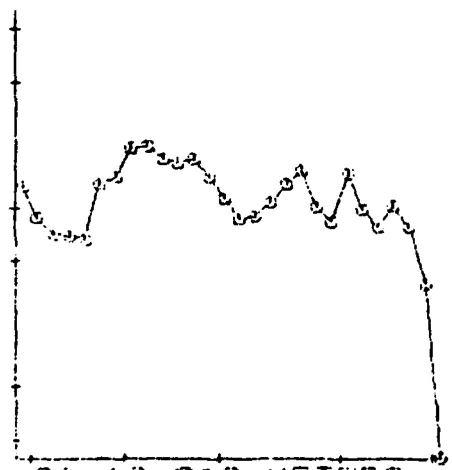
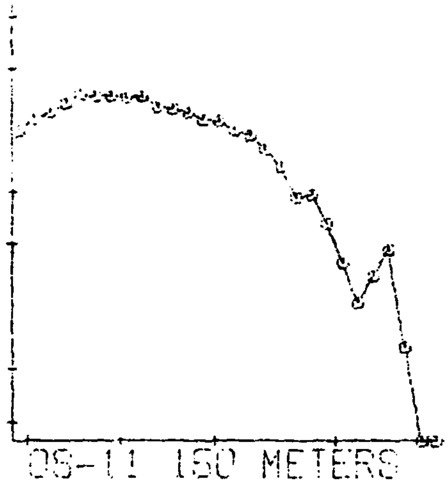
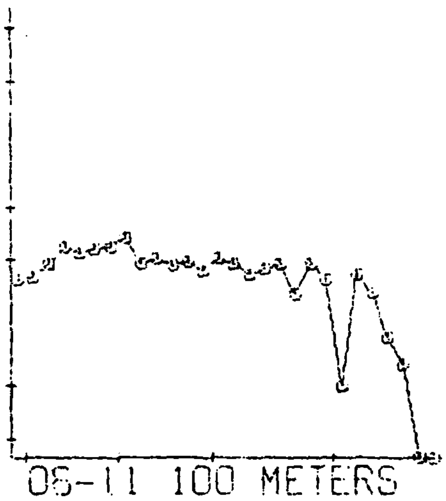


09-10 010 METERS

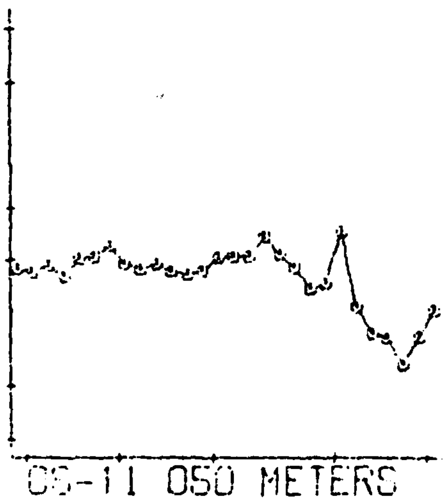
09-10 000 METERS


OS-11 150 METERS


OS-11 150 ZONED

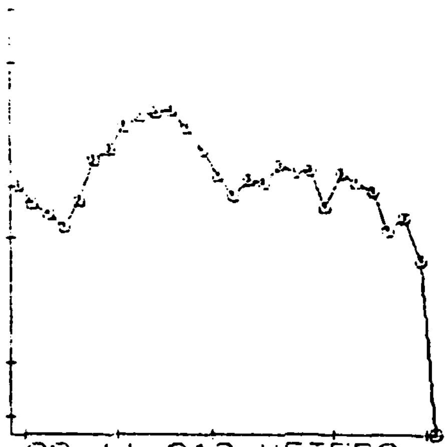

OS-11 100 METERS


OS-11 075 METERS


OS-11 050 METERS


OS-11 030 METERS

08-11 020 METERS



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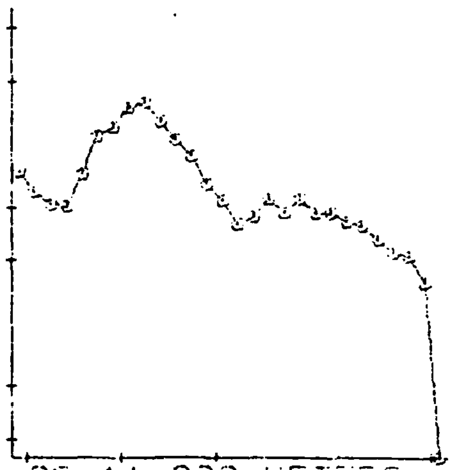
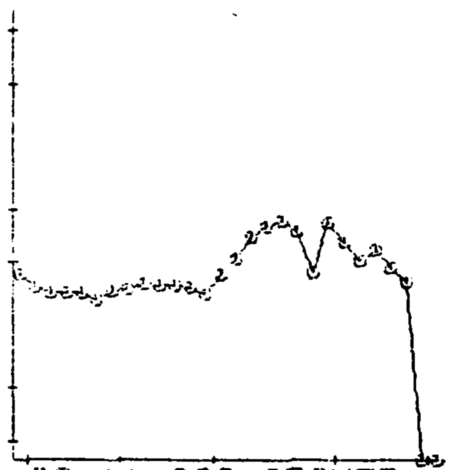


08-11 000 METERS



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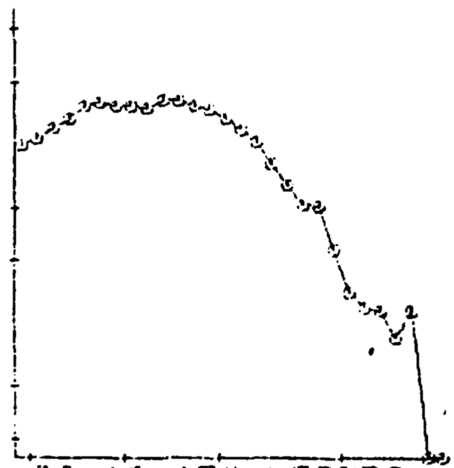
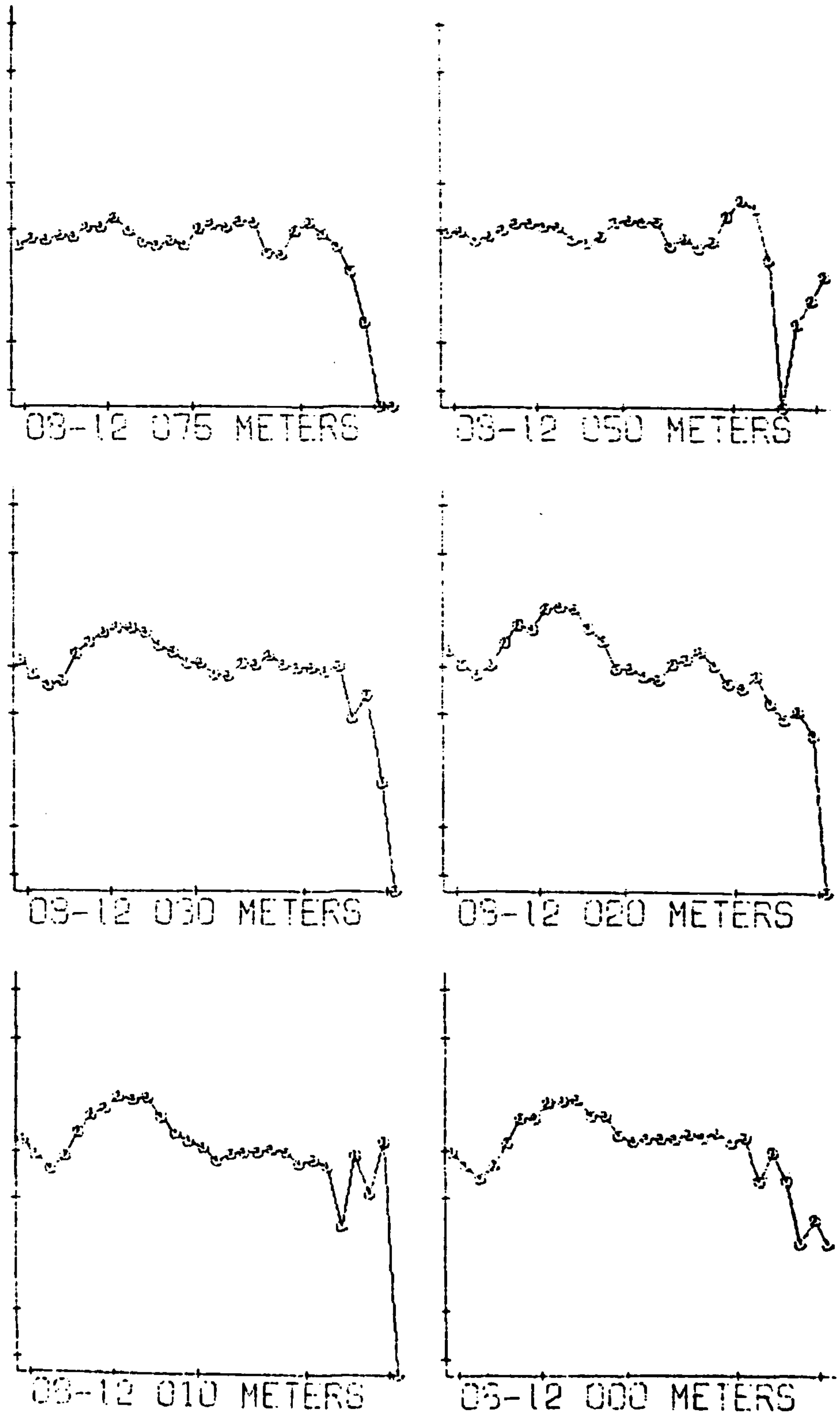
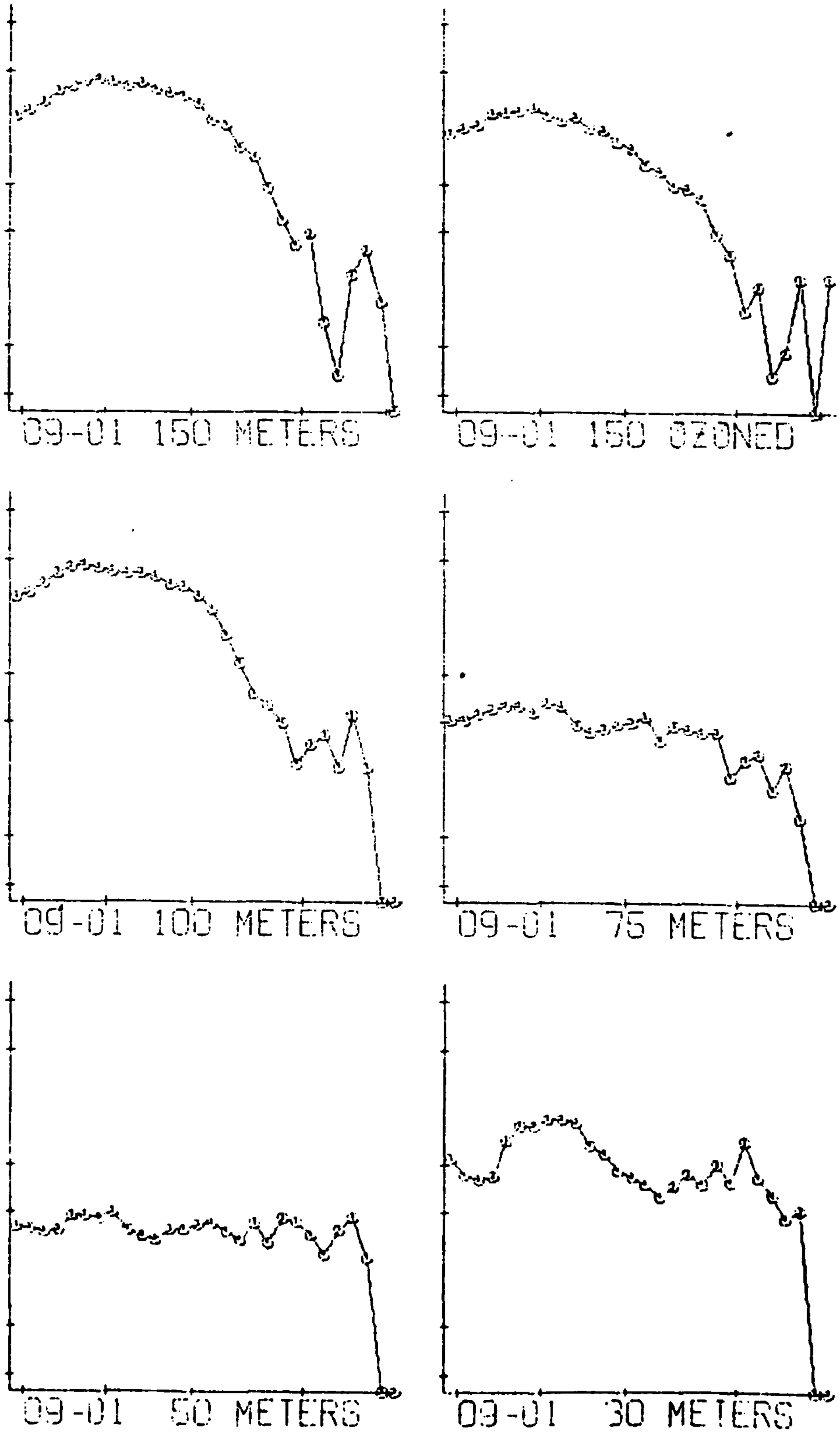


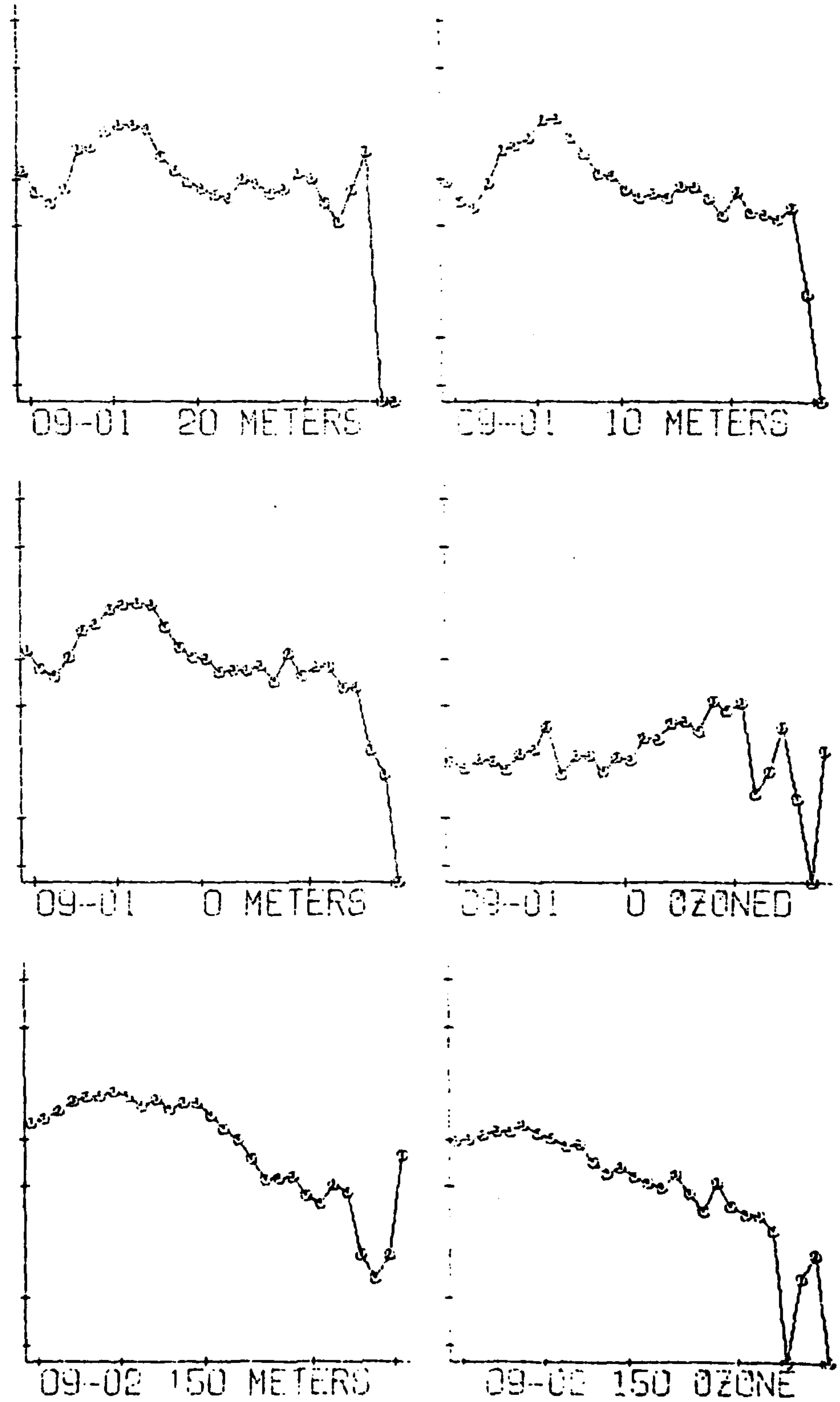
08-12 150 METERS

08-12 100 METERS

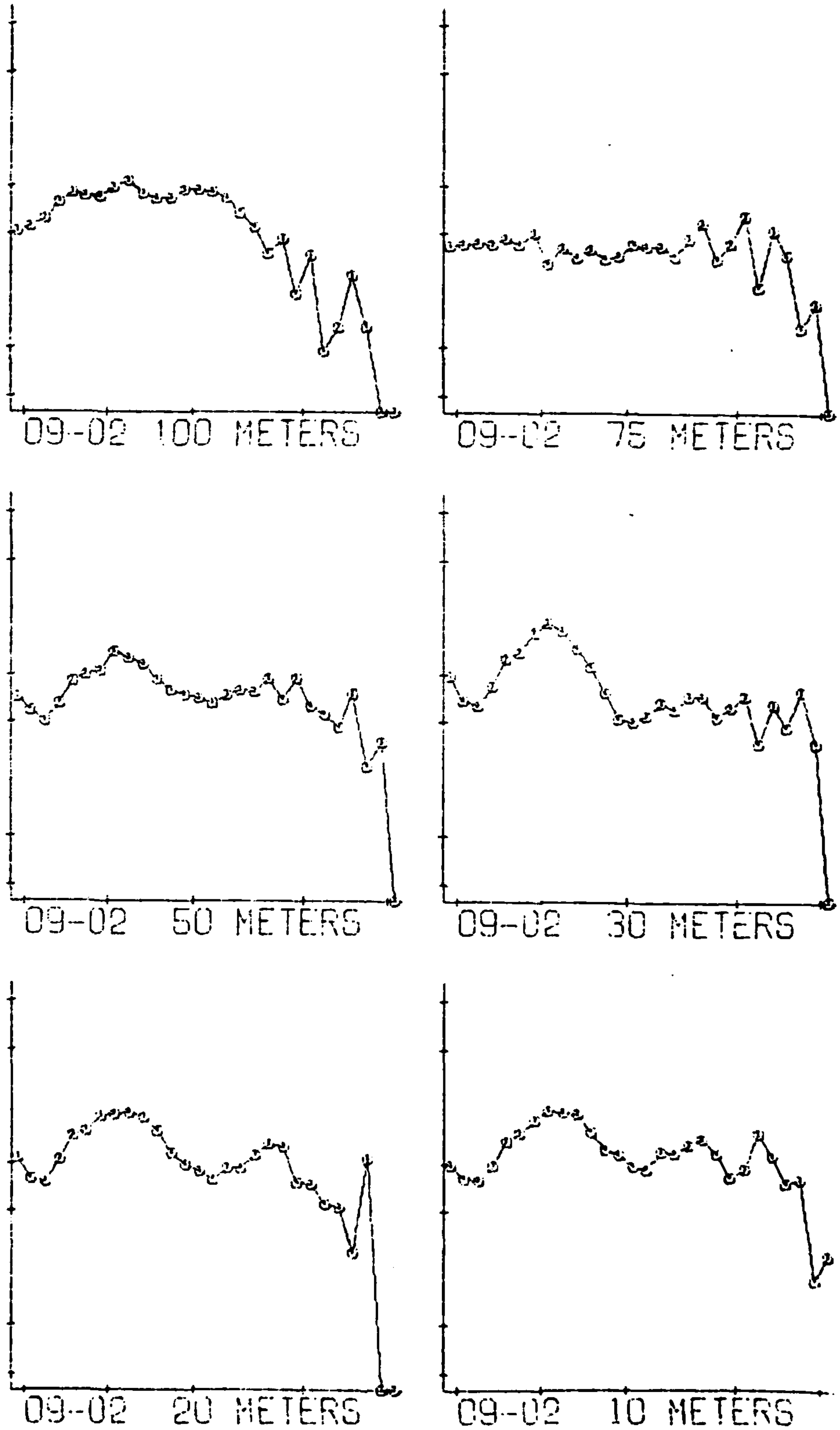

03-12 075 METERS
03-12 050 METERS
03-12 030 METERS
03-12 020 METERS
03-12 010 METERS
03-12 000 METERS

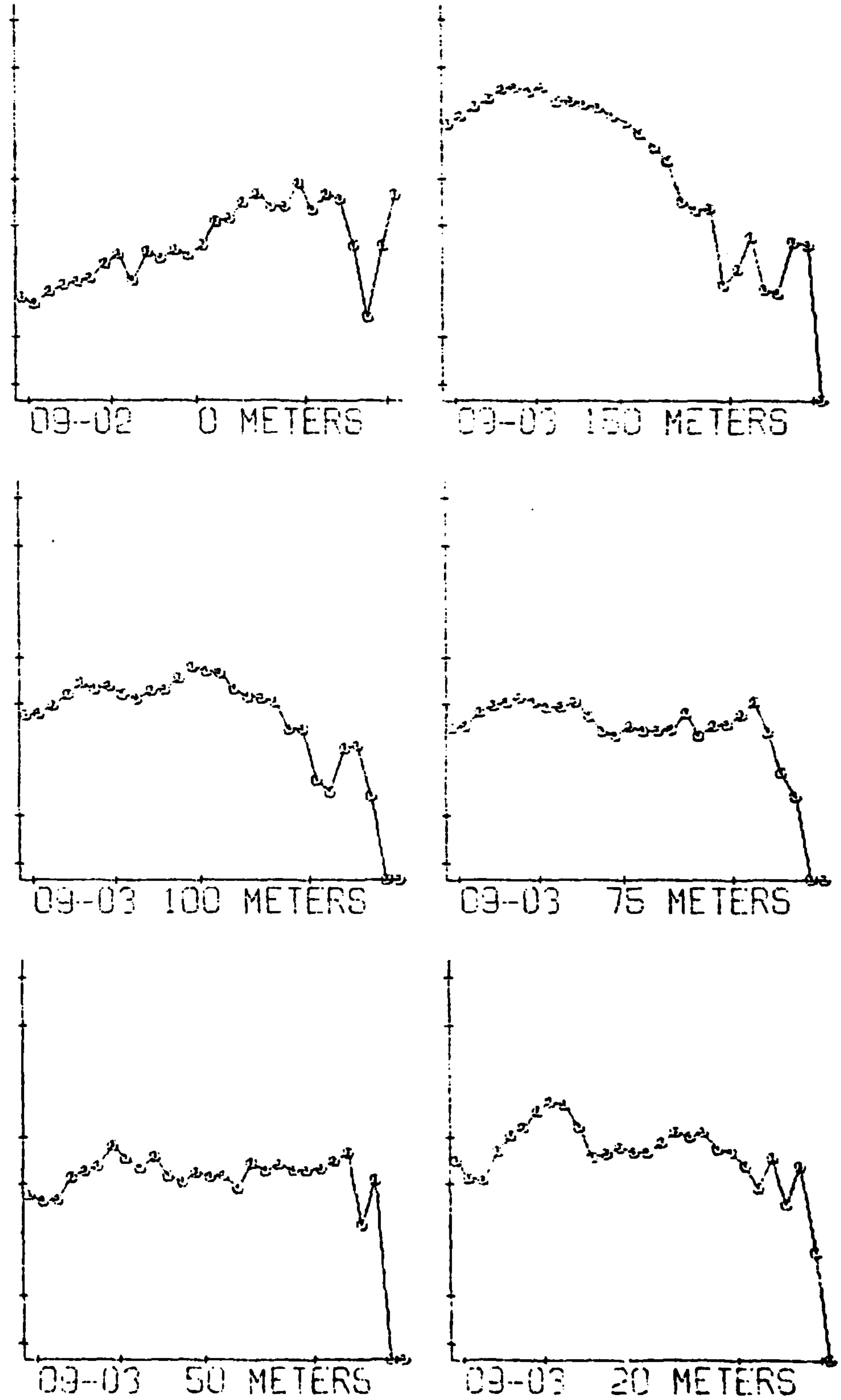


09-01 150 METERS
09-01 150 OZONED
09-01 100 METERS
09-01 75 METERS
09-01 50 METERS
09-01 30 METERS

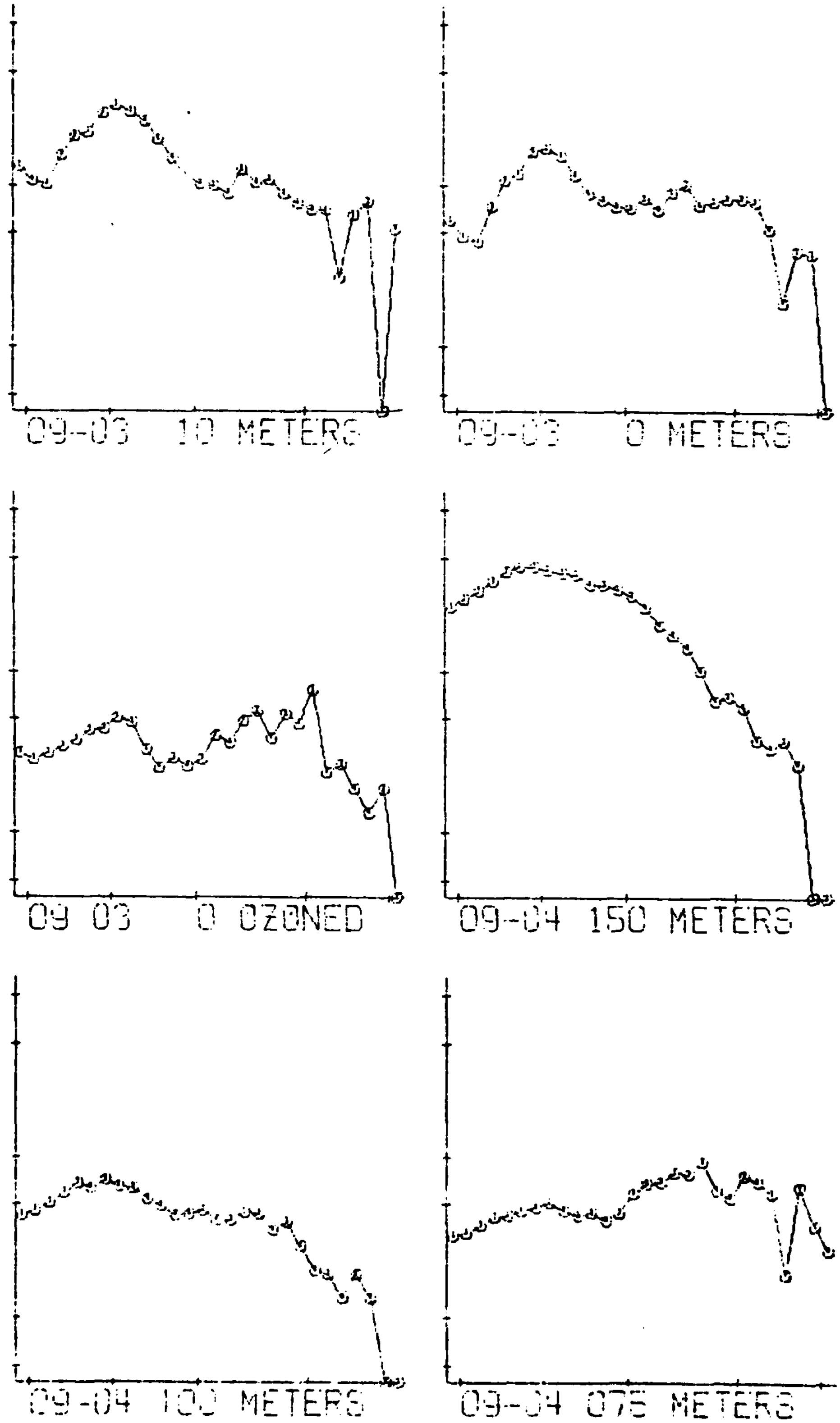


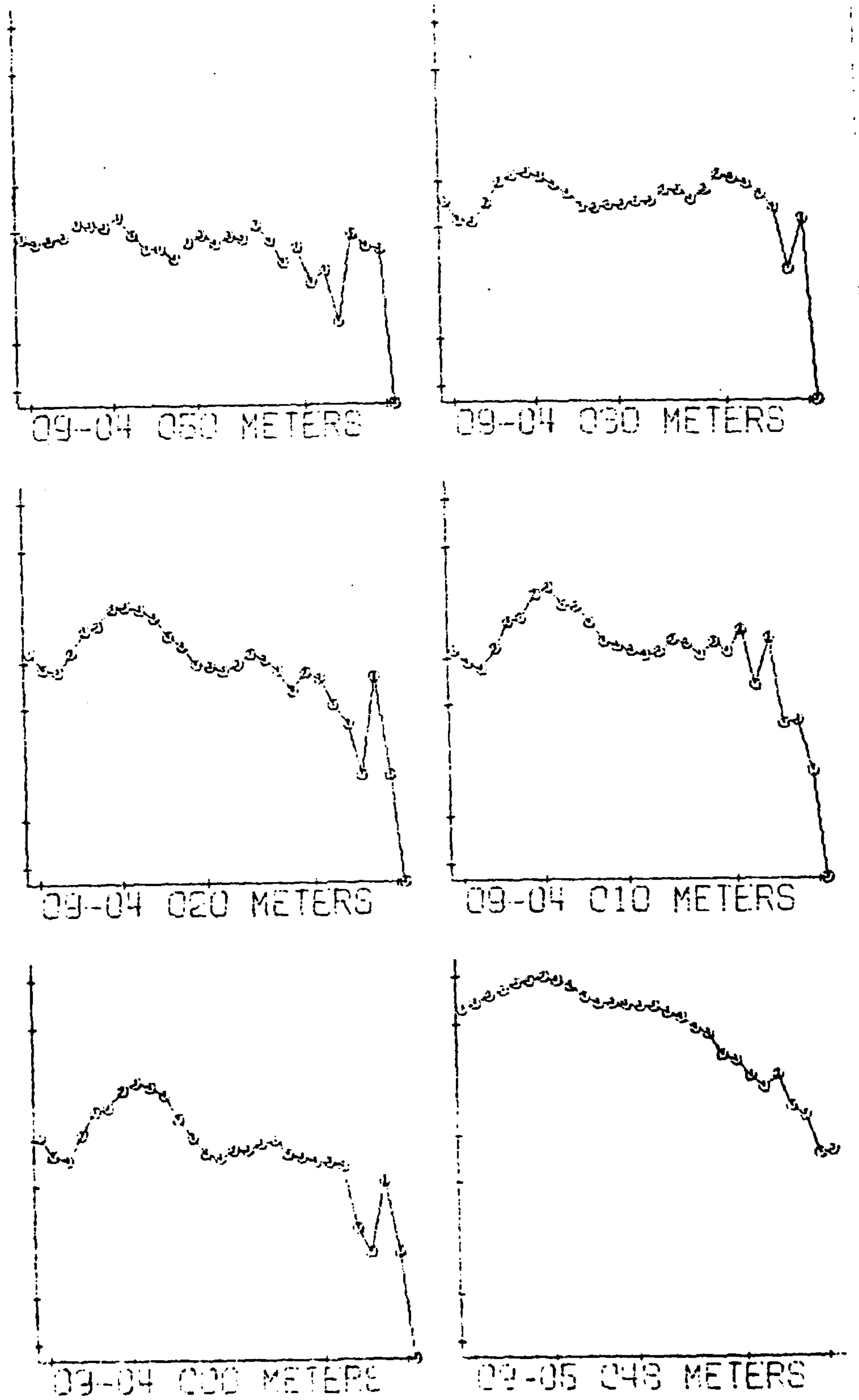
09-01 20 METERS
09-01 10 METERS
09-01 0 METERS
09-01 0 OZONED
09-02 150 METERS
09-02 150 OZONE


09-02 100 METERS
09-02 75 METERS
09-02 50 METERS
09-02 30 METERS
09-02 20 METERS
09-02 10 METERS



09-02 0 METERS
09-03 150 METERS
09-03 100 METERS
09-03 75 METERS
09-03 50 METERS
09-03 20 METERS


09-03 10 METERS
09-03 0 METERS
09 03 0 OZONED
09-04 150 METERS
09-04 100 METERS
09-04 075 METERS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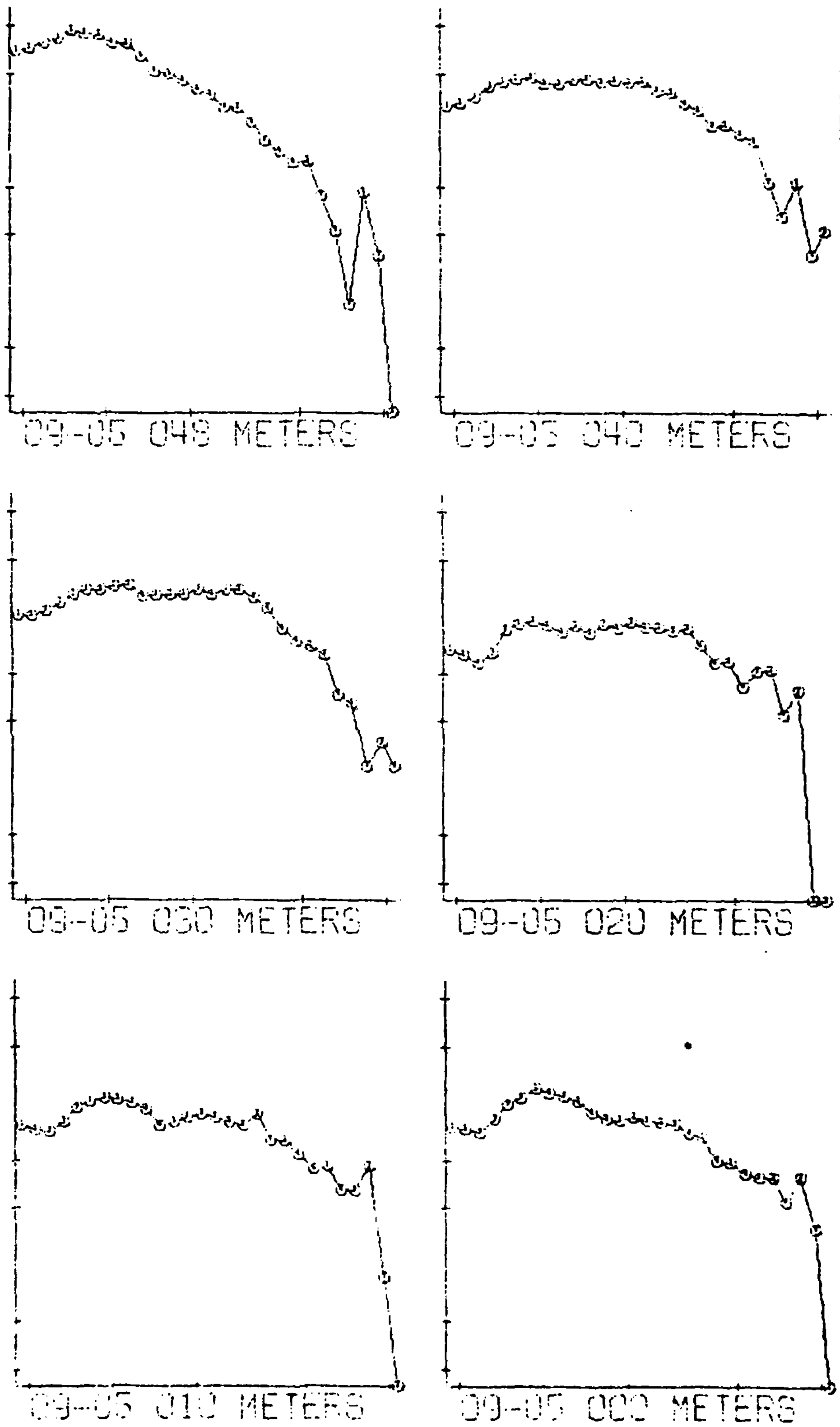
09-04 030 METERS
09-04 020 METERS
09-04 010 METERS
09-04 000 METERS
09-05 048 METERS



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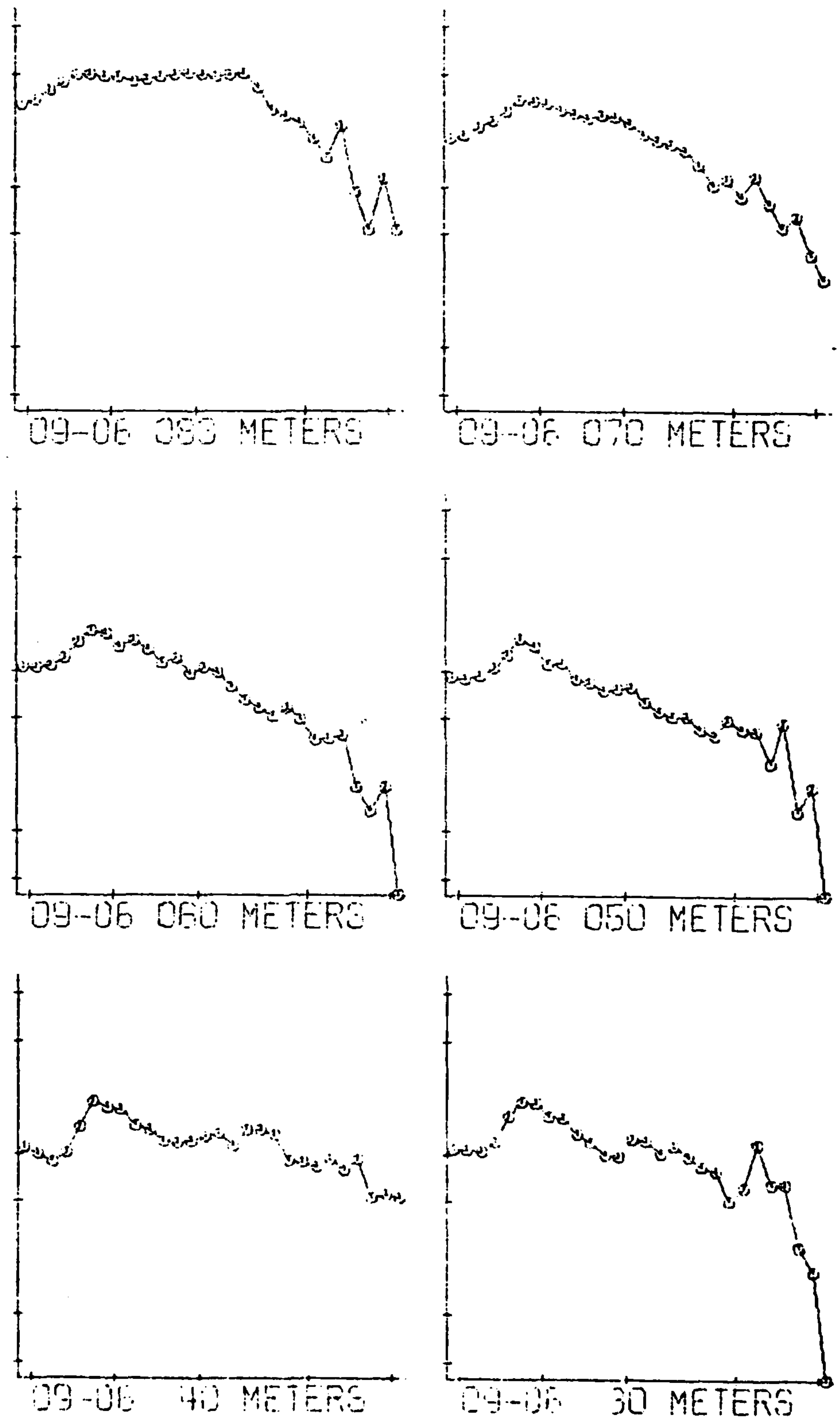
09-05 040 METERS
09-05 030 METERS
09-05 020 METERS
09-05 010 METERS
09-05 000 METERS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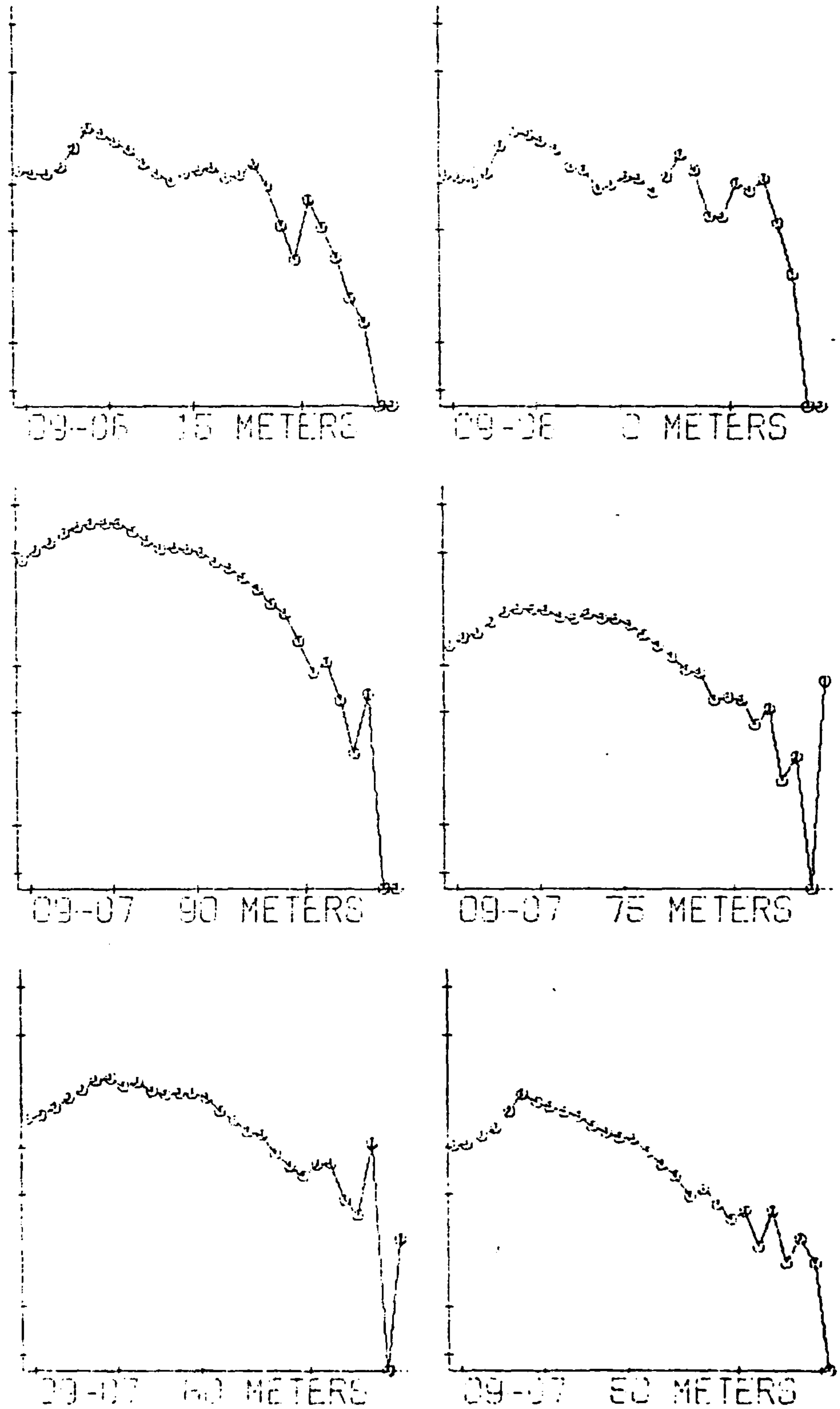
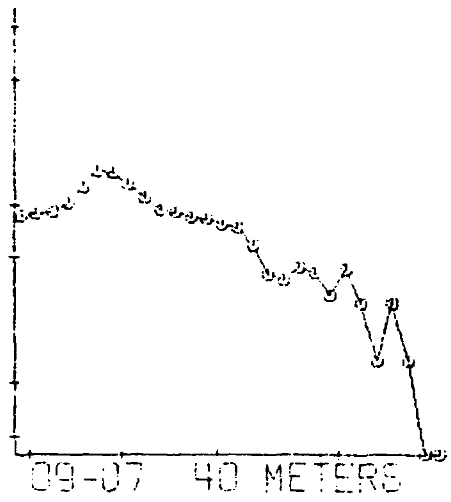
09-06 070 METERS
09-06 060 METERS
09-06 050 METERS
09-06 40 METERS
09-06 30 METERS


09-06 15 METERS
09-06 0 METERS
09-07 90 METERS
09-07 75 METERS
09-07 60 METERS
09-07
METERS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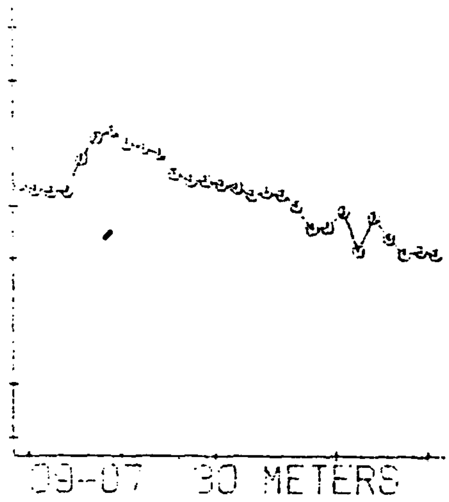
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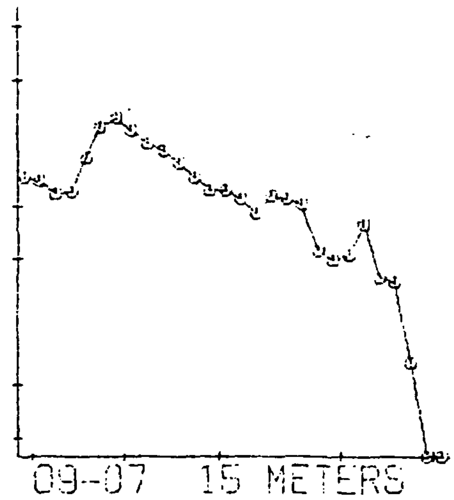
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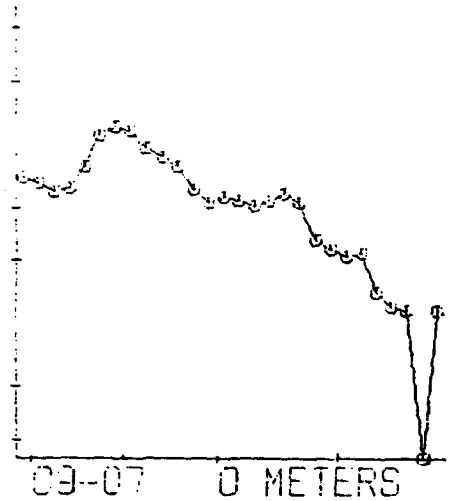
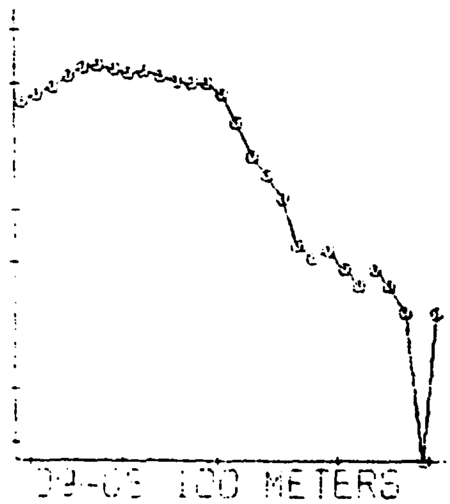
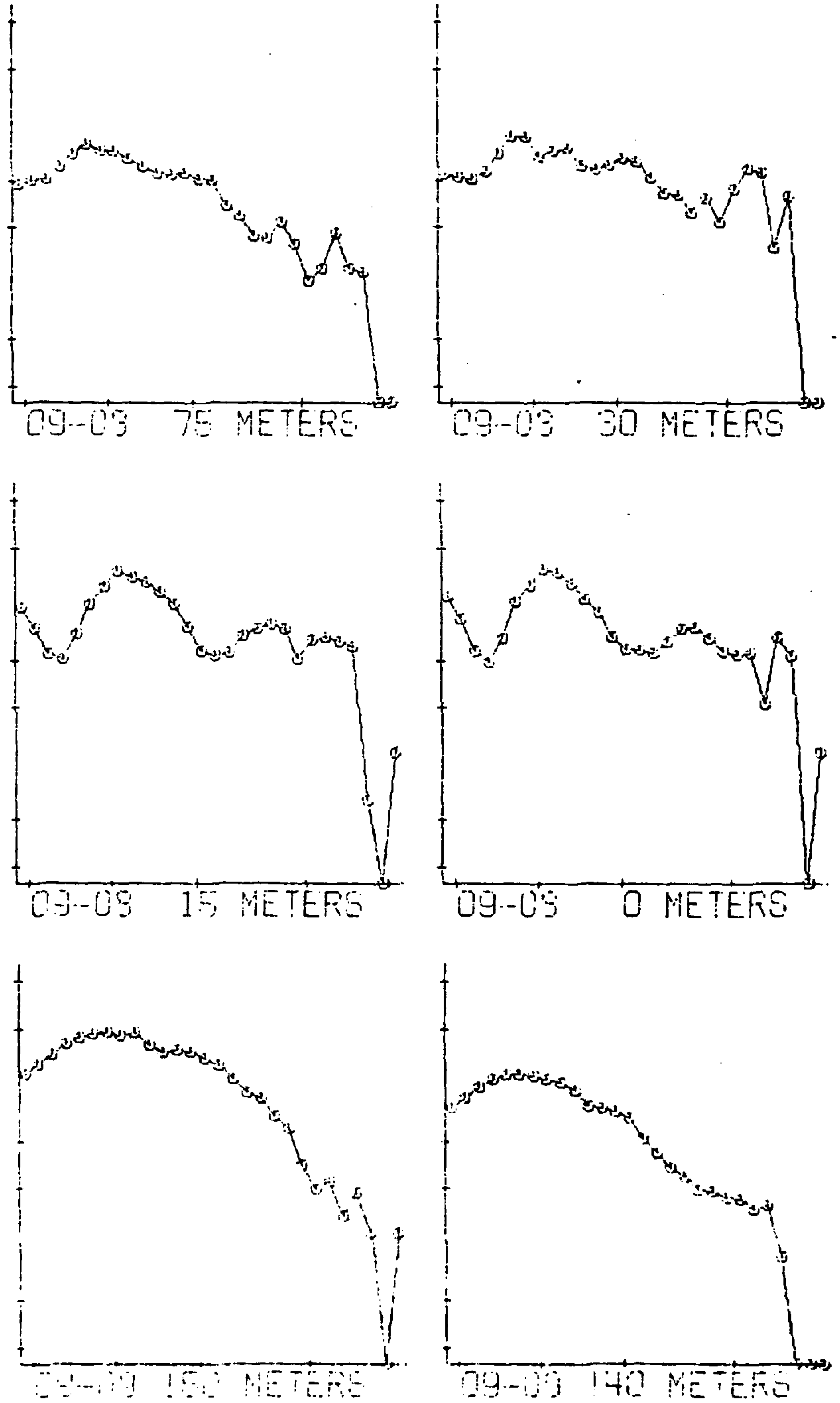
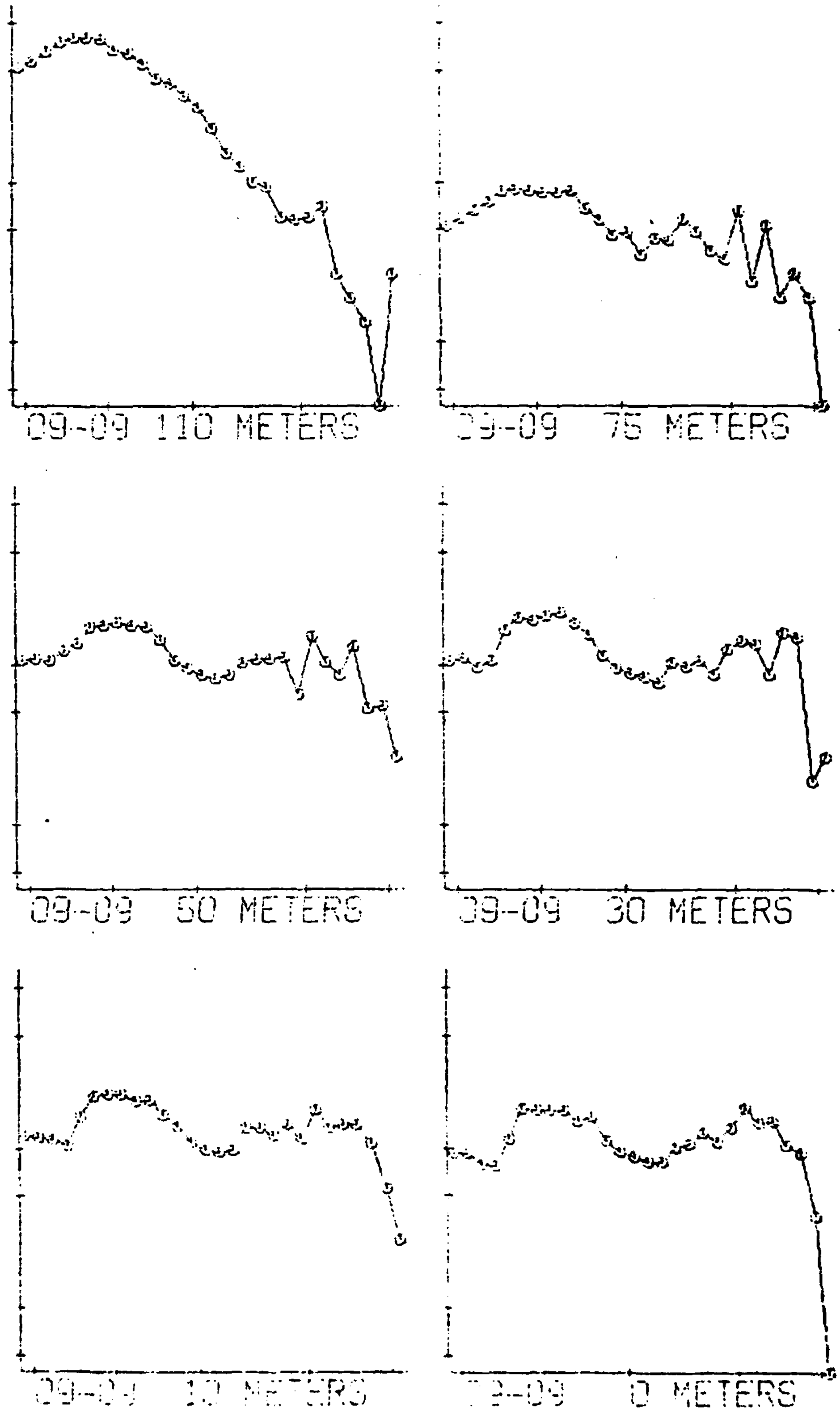

09-07 0 METERS


09-05 METERS


100 METERS


09-09 75 METERS
09-09 30 METERS
09-09 15 METERS
09-09 0 METERS
METERS
09-09 140 METERS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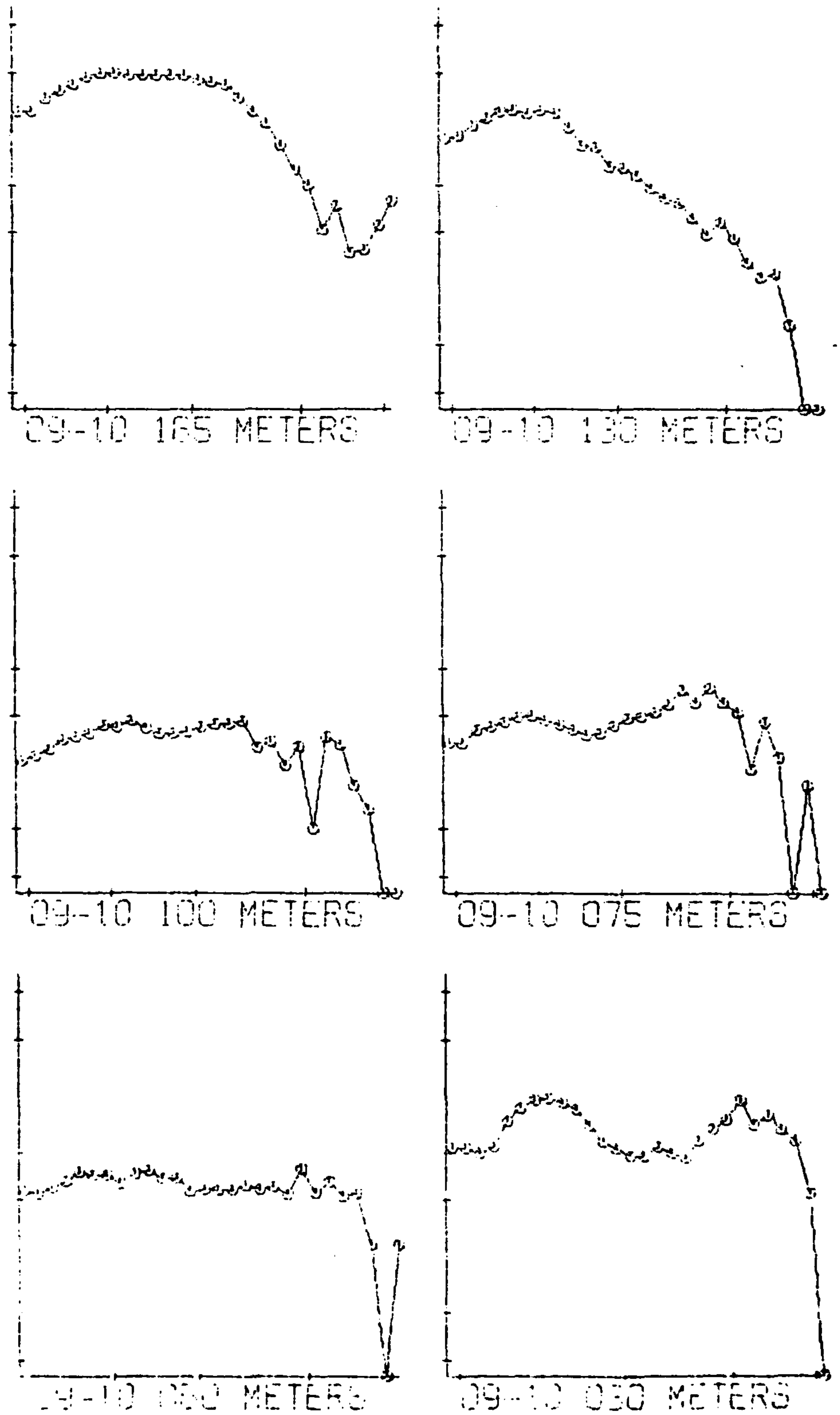
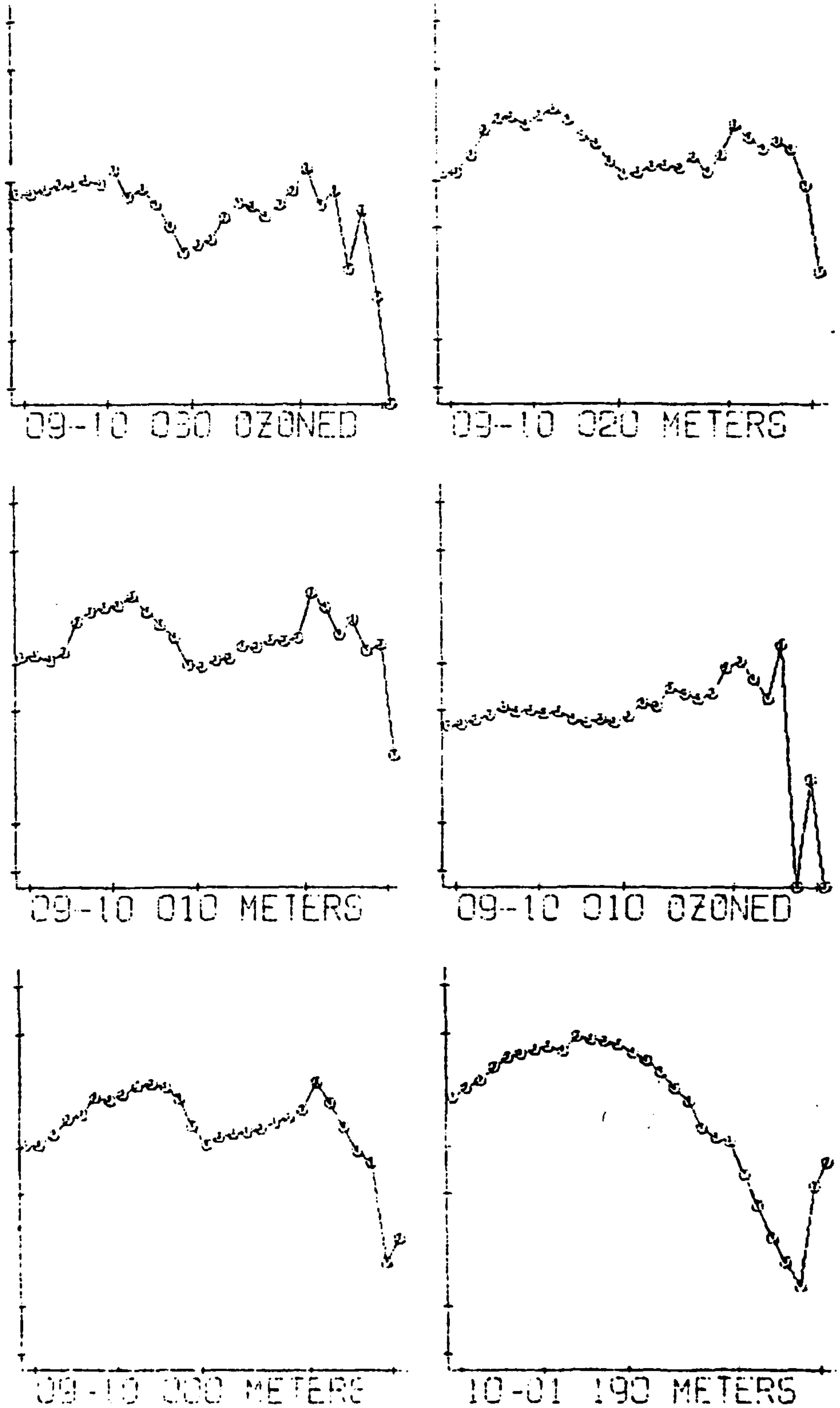
09-09 50 METERS
09-09 30 METERS
09-09 10 METERS
09-09 0 METERS


09-10 165 METERS
09-10 130 METERS
09-10 100 METERS
09-10 075 METERS
9-10 050 METERS
09-10 030 METERS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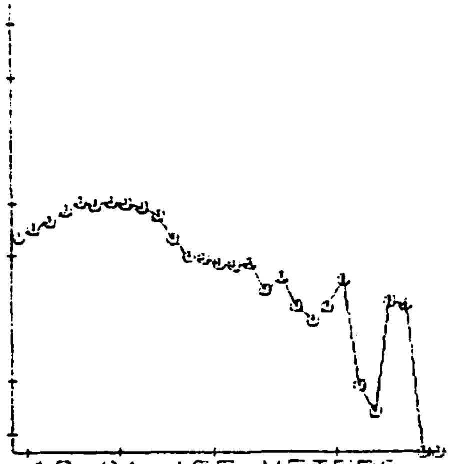
09-10 020 METERS
09-10 010 METERS
09-10 010 OZONED
09-10 000 METERS
10-01 190 METERS



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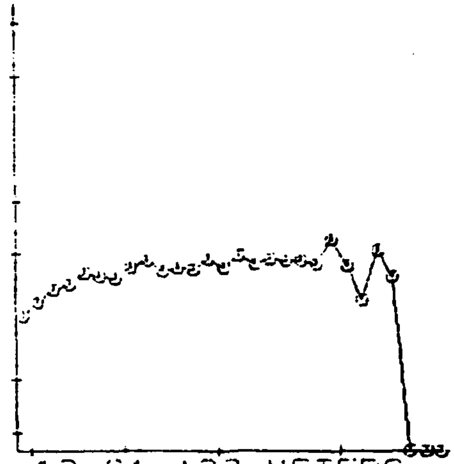
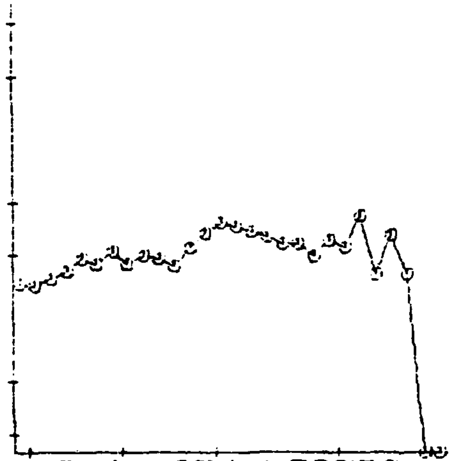
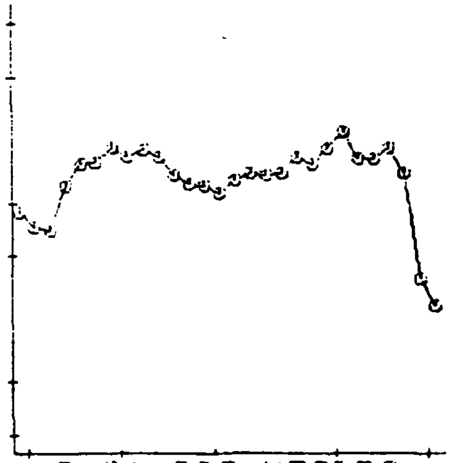


10-01 100 METERS



10-01 050 METERS



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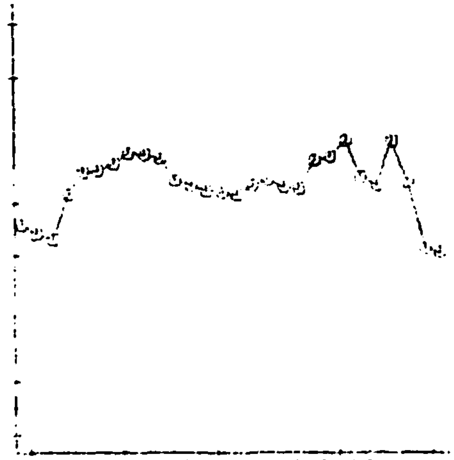
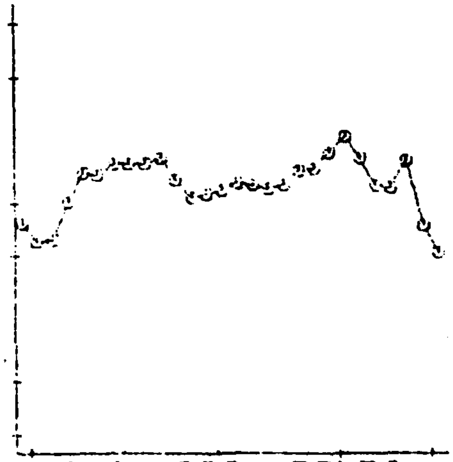
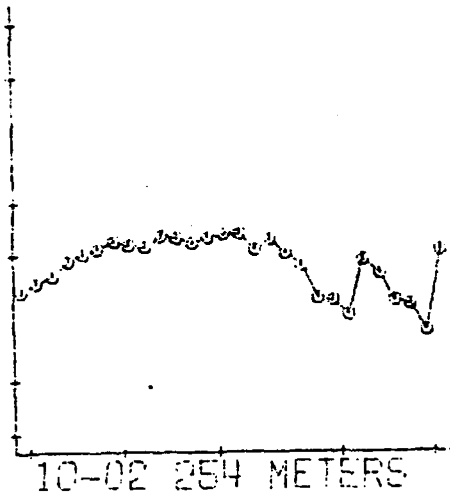


10-01 010 METERS



10-01 000 METERS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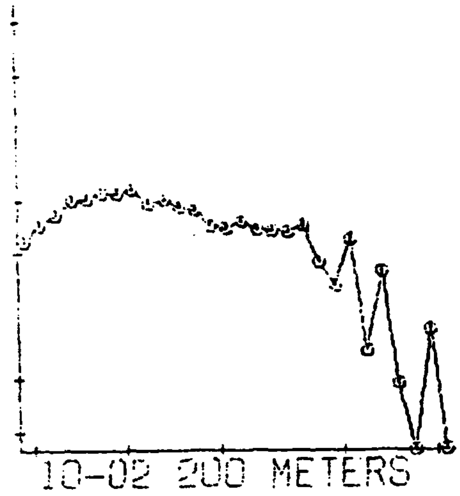
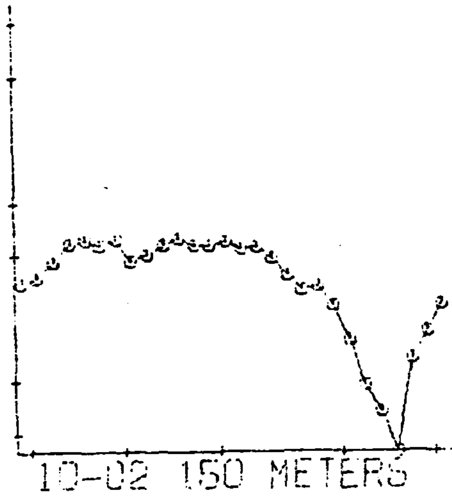
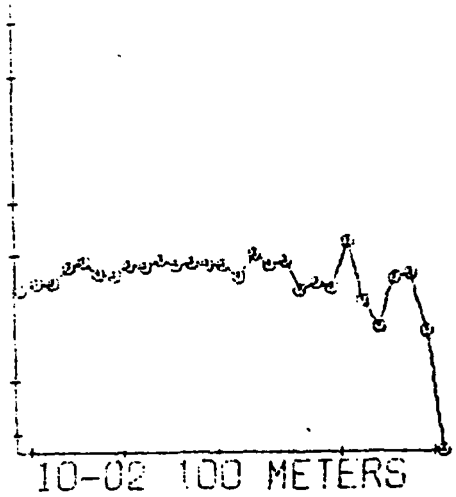

10-02 200 METERS


10-02 150 METERS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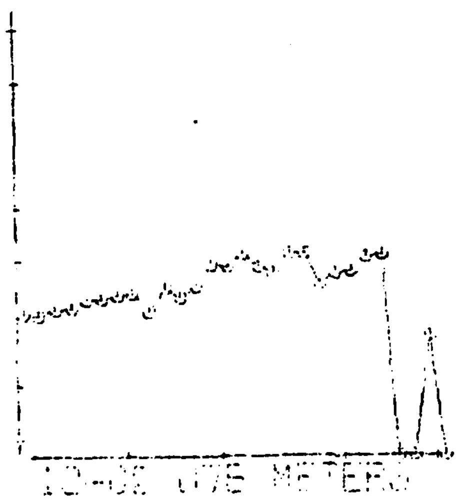
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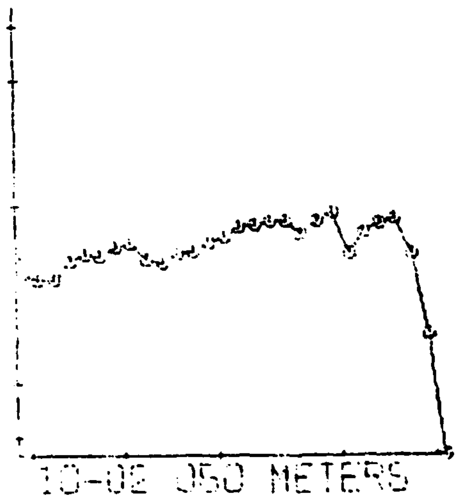
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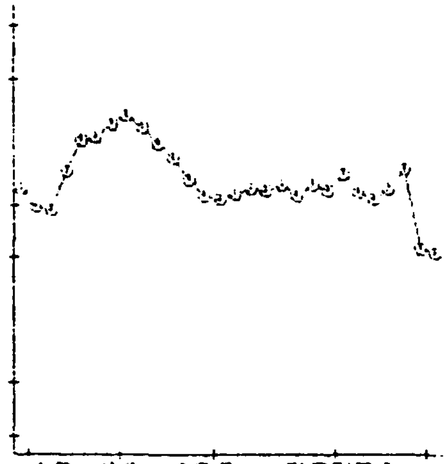
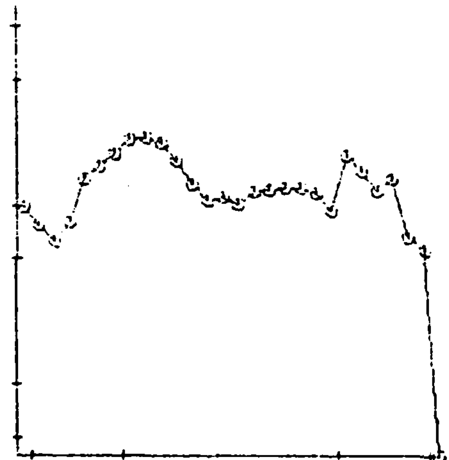
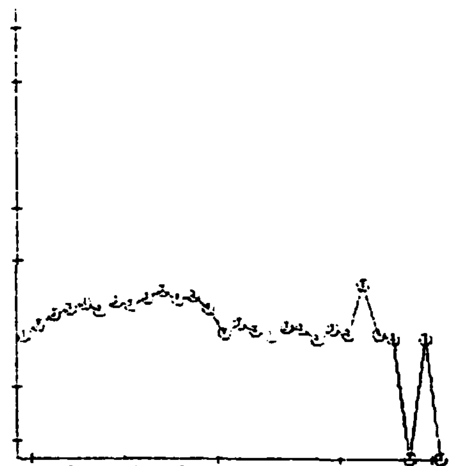


10-02 030 METERS

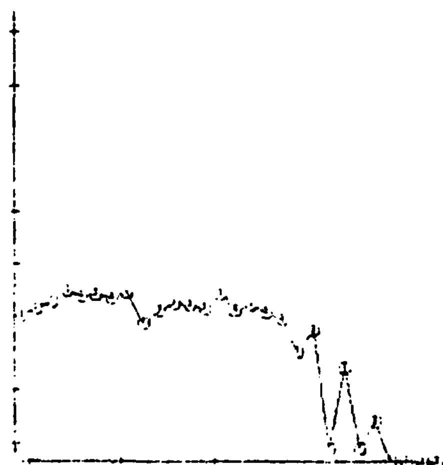
10-02 15 METERS



10-02 000 METERS



10-03 300 METERS



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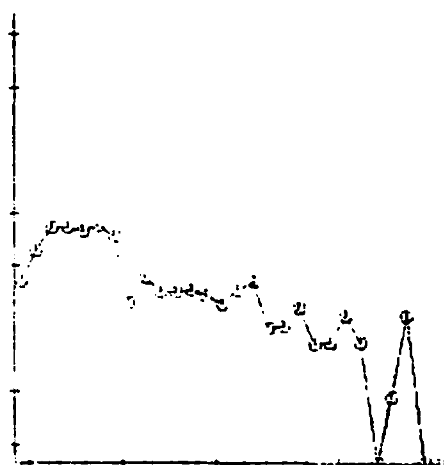
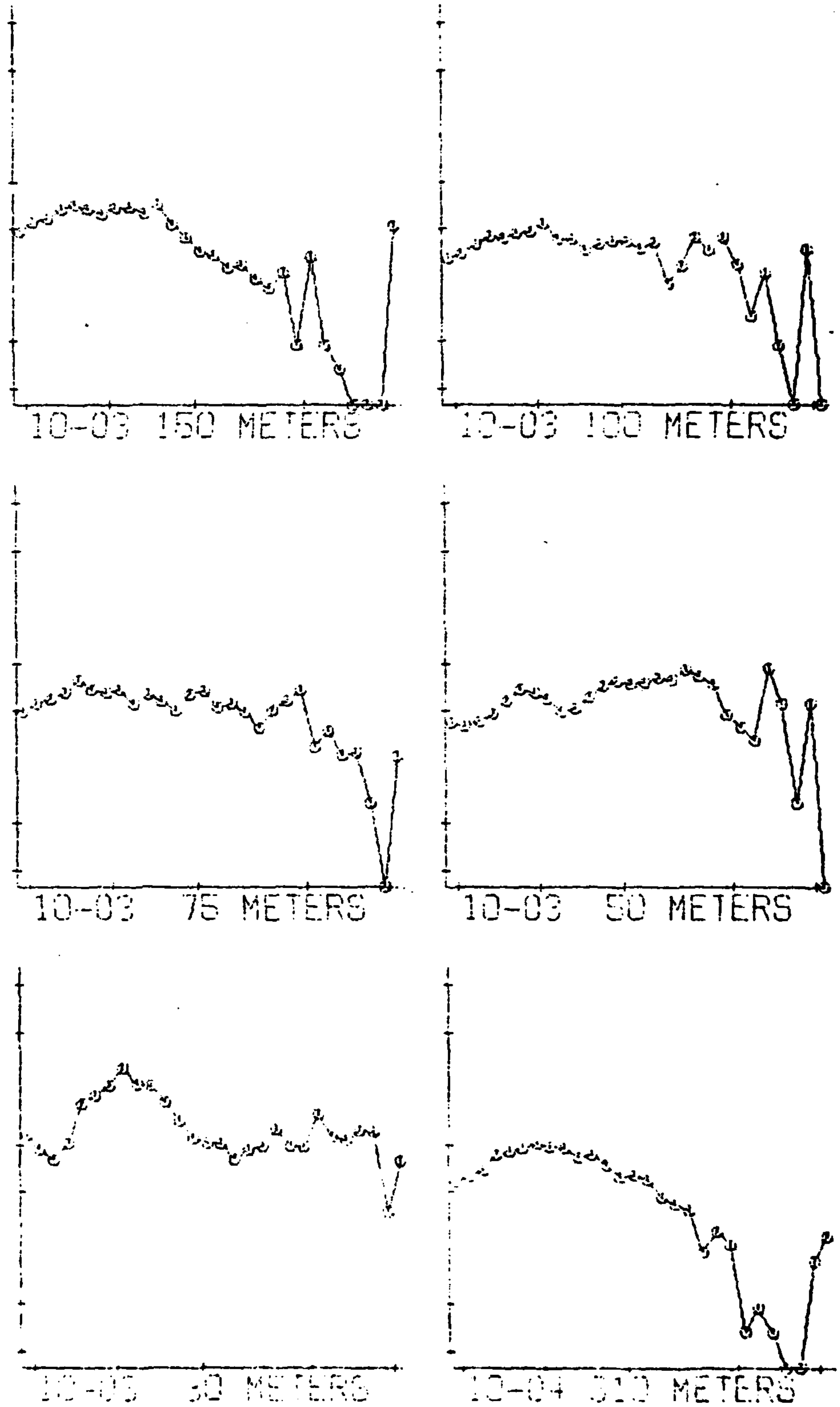
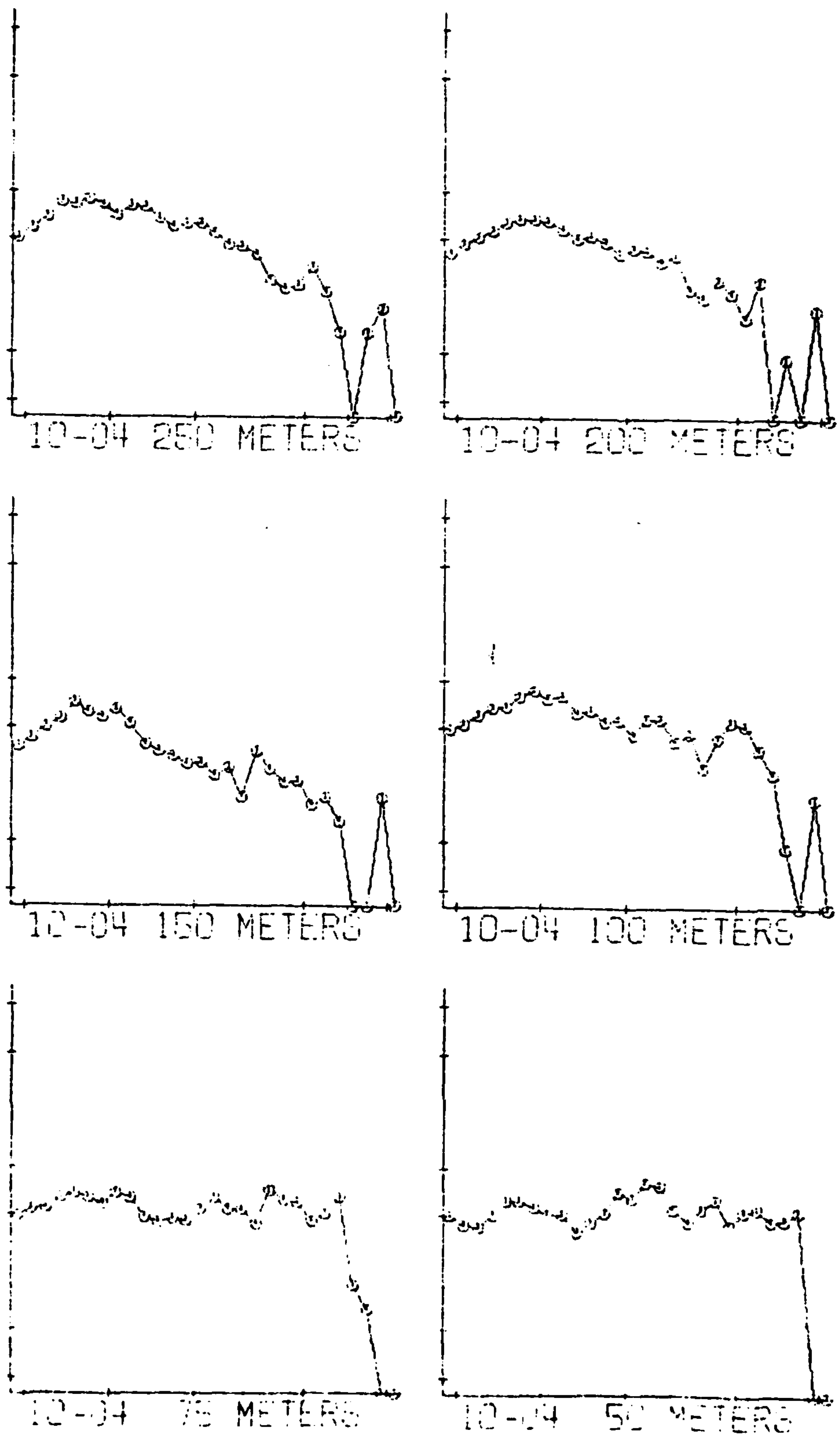


10-03 200 METERS



10-03 150 METERS
10-03 100 METERS
10-03 75 METERS
10-03 50 METERS
METERS
10-04 METERS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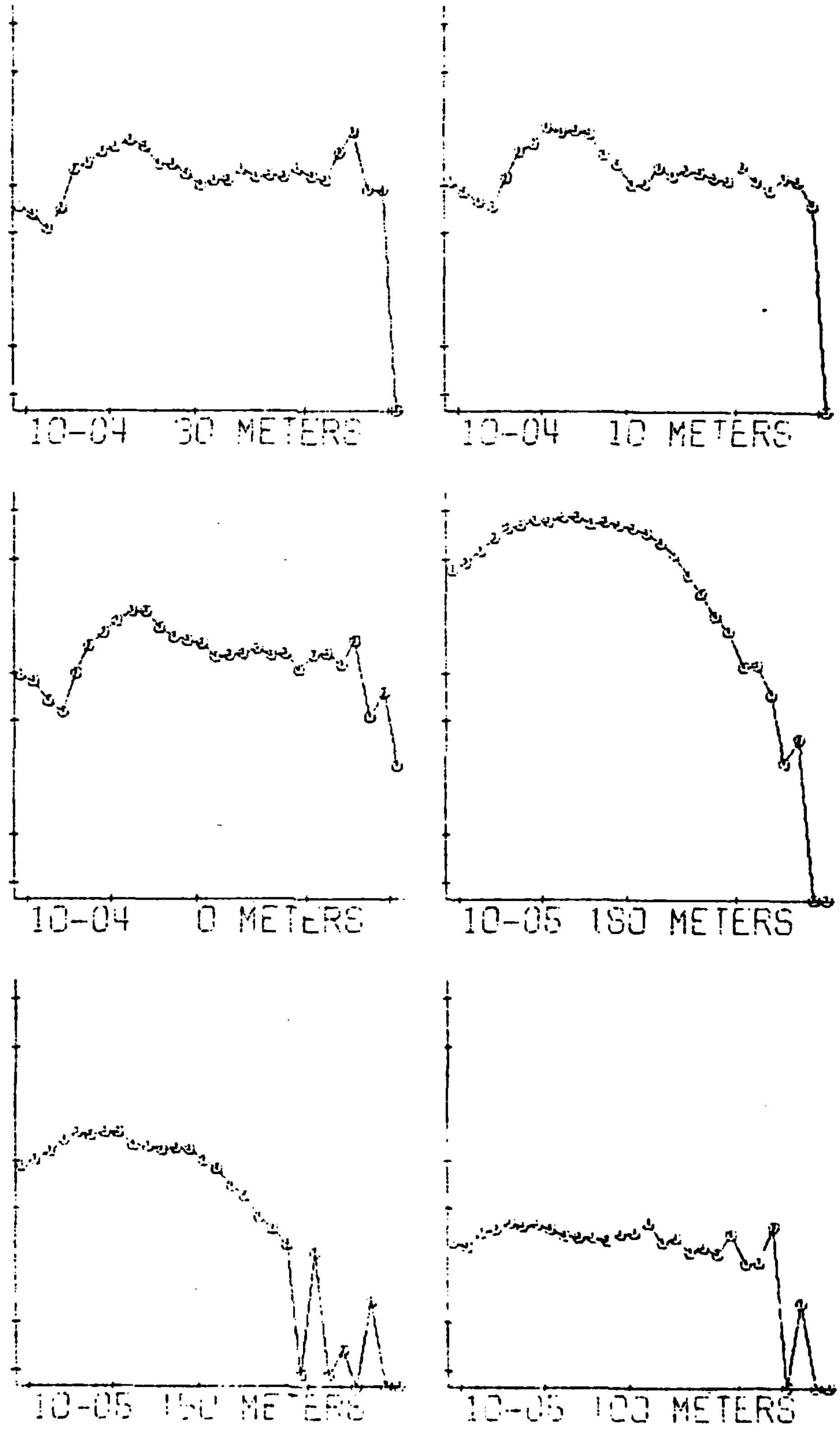
10-04 200 METERS
10-04 150 METERS
10-04 100 METERS
10-04 75 METERS
10-04 50 METERS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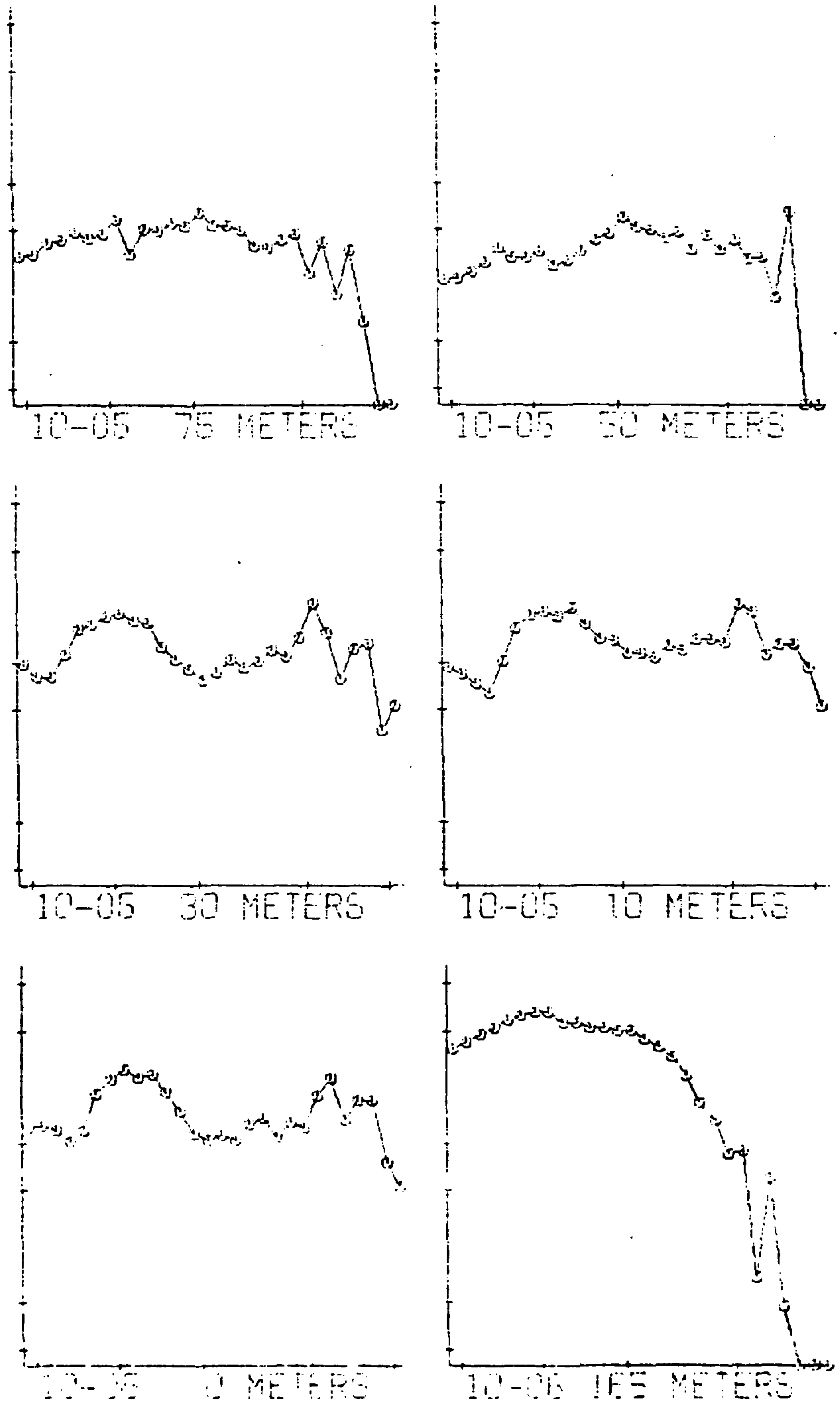
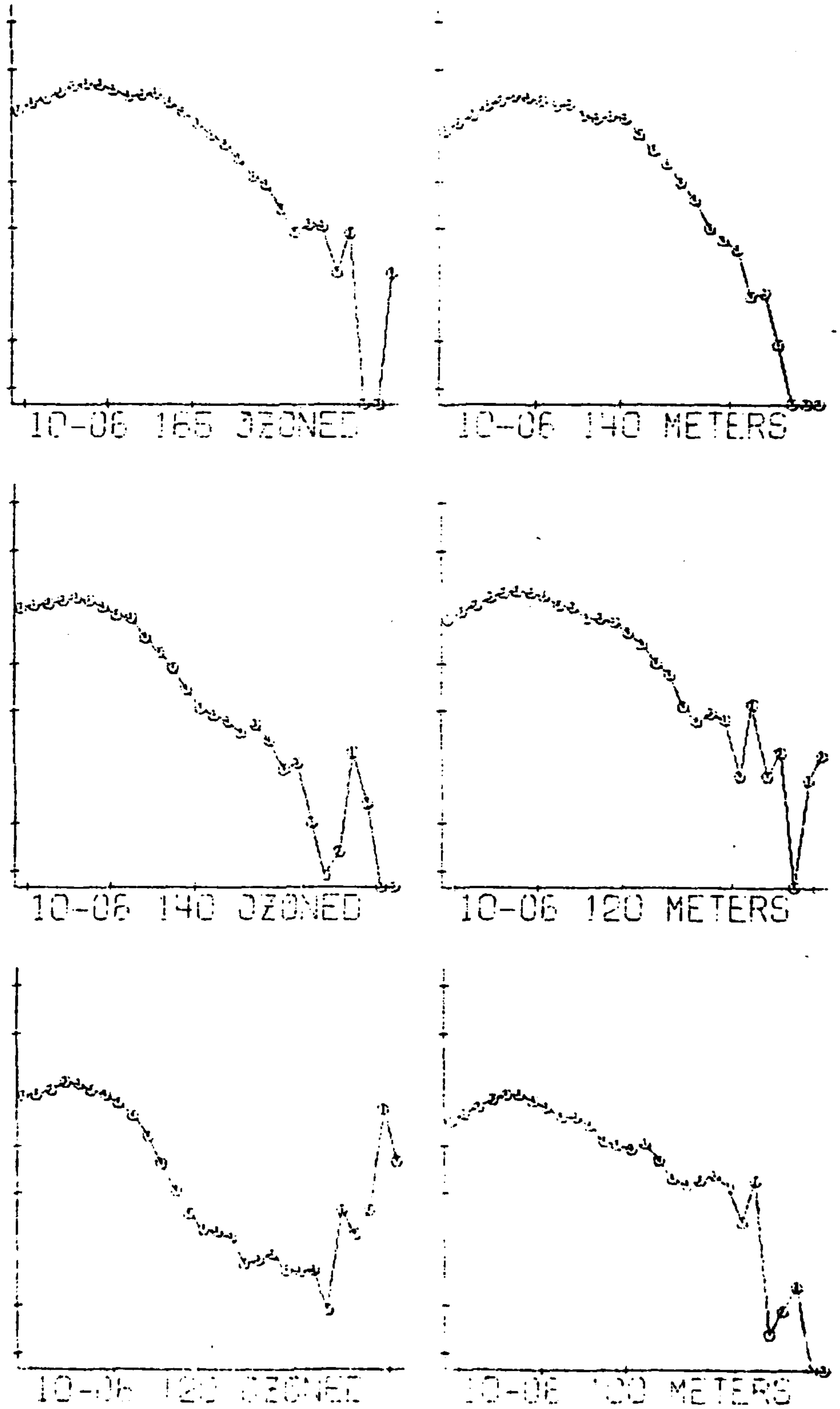
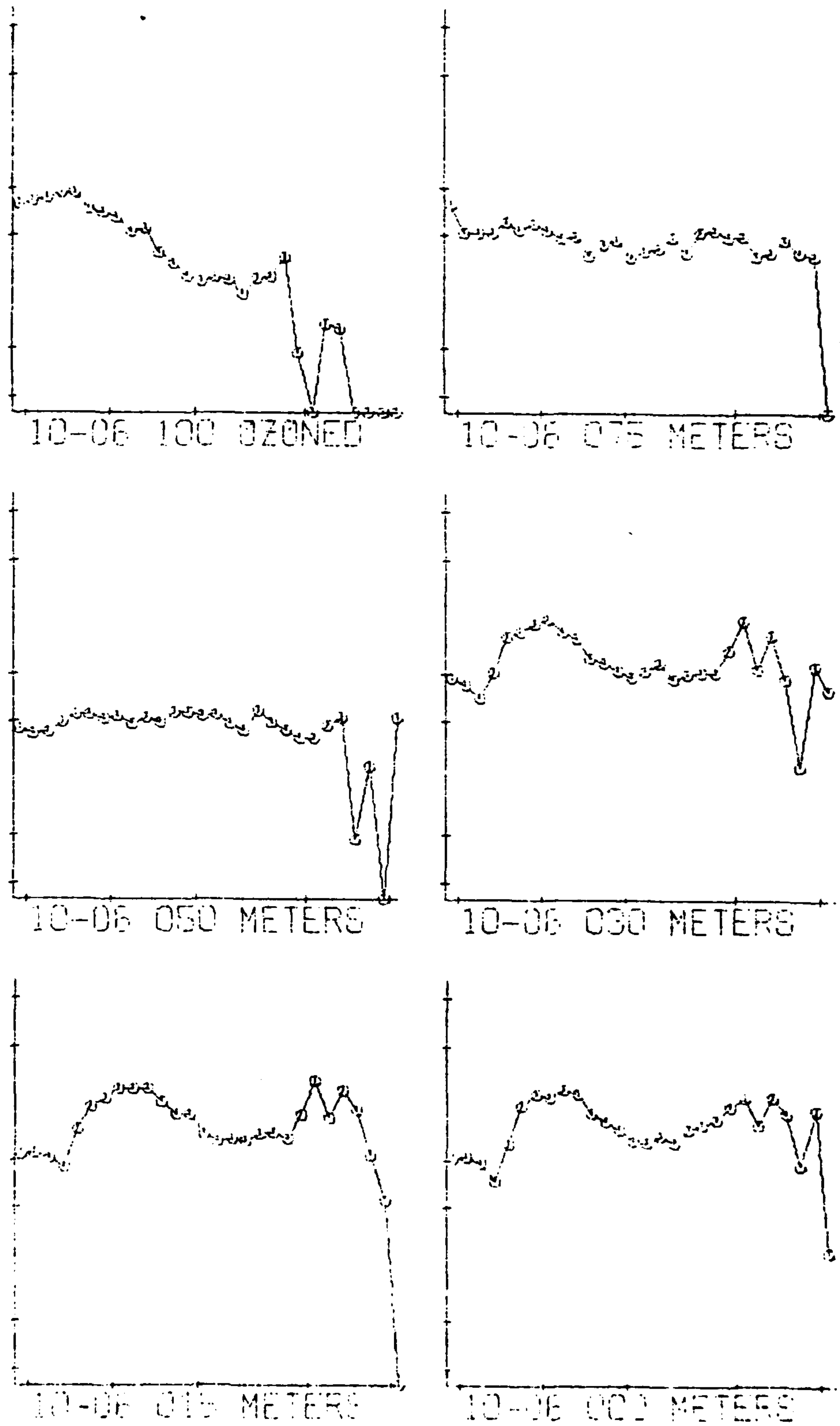
10-04 0 METERS
10-05 180 METERS
10-05 150 METERS
10-05 100 METERS


10-05 75 METERS
10-05 50 METERS
10-05 30 METERS
10-05 10 METERS
10-06 165 METERS


10-06 165 OZONED
10-06 140 METERS
10-06 140 OZONED
10-06 120 METERS
10-06 120 OZONED
10-06 100 METERS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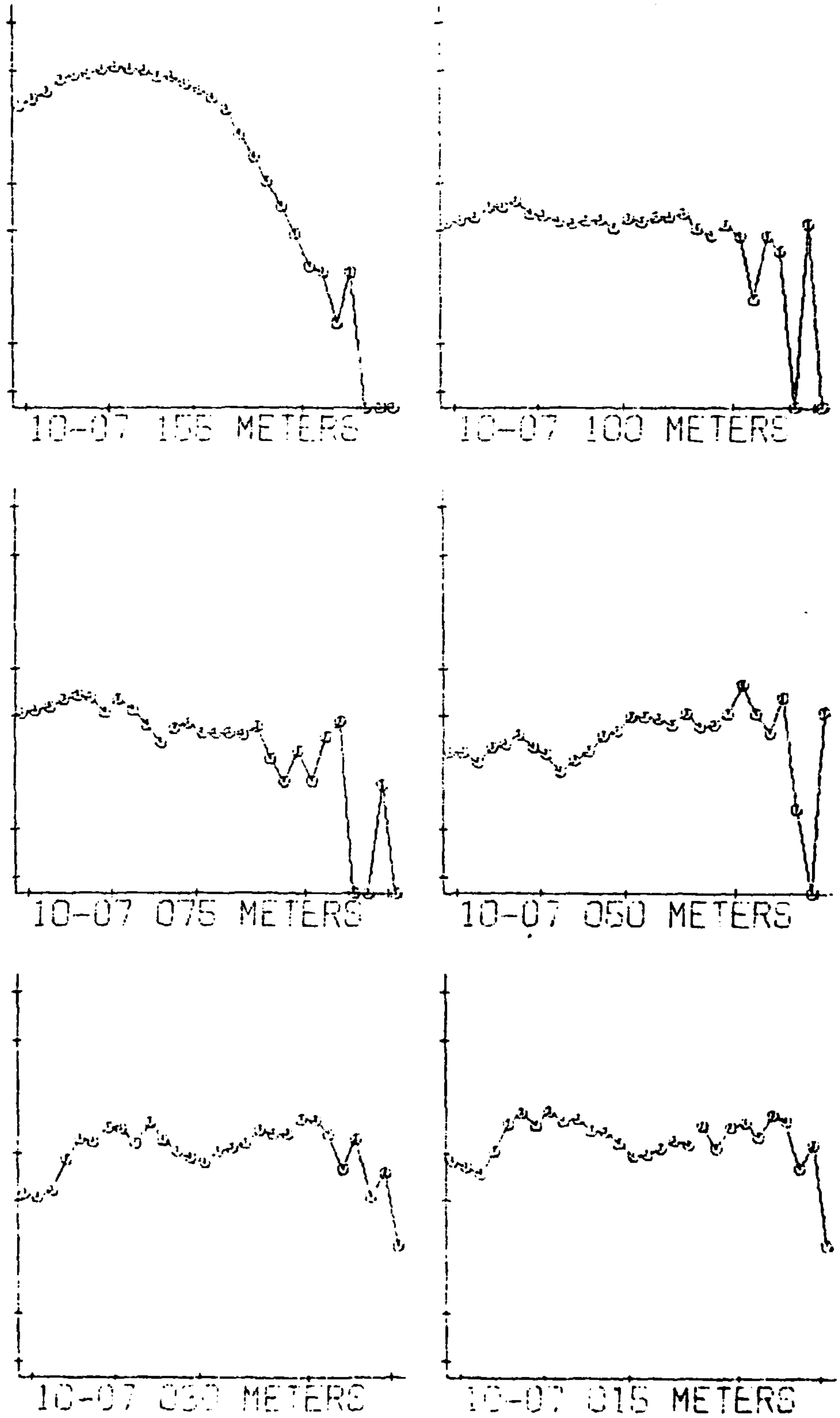
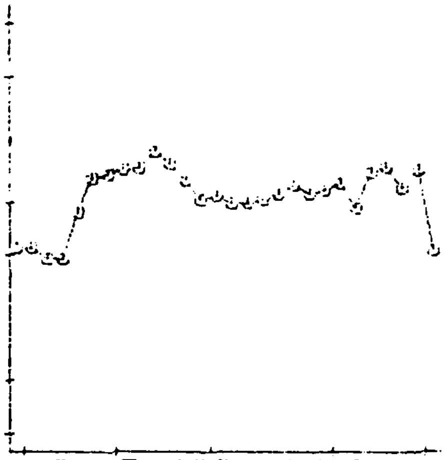
10-06 075 METERS
10-06 050 METERS
10-06 030 METERS
10-06 015 METERS
10-06 000 METERS


10-07 155 METERS
10-07 100 METERS
10-07 075 METERS
10-07 050 METERS
10-07 030 METERS
10-07 015 METERS



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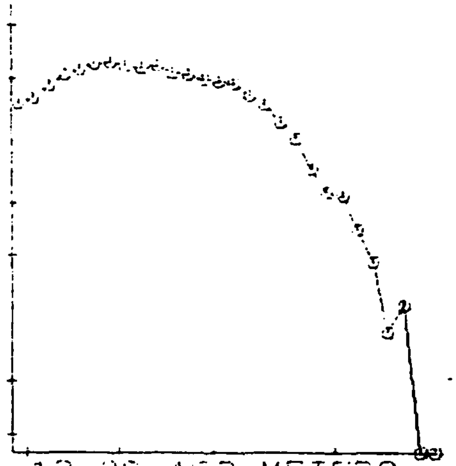

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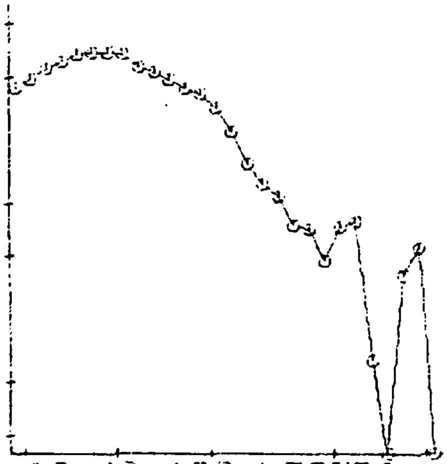

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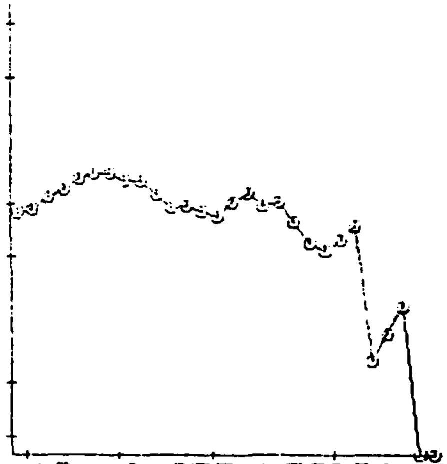
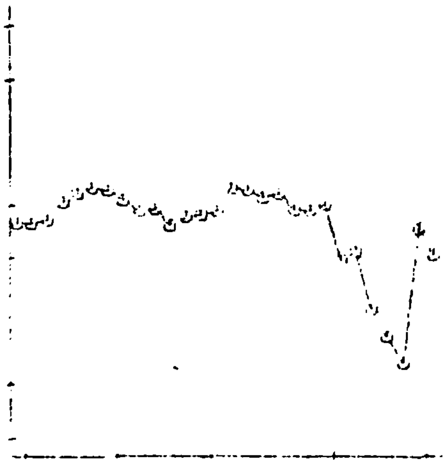
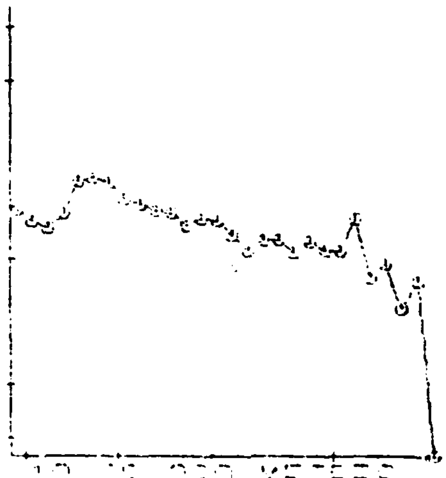


10-09 075 METERS



10-09 050 METERS



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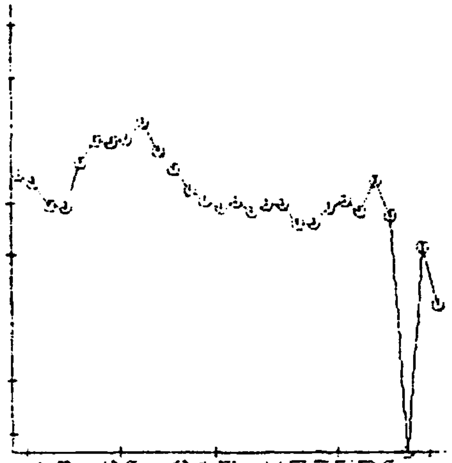

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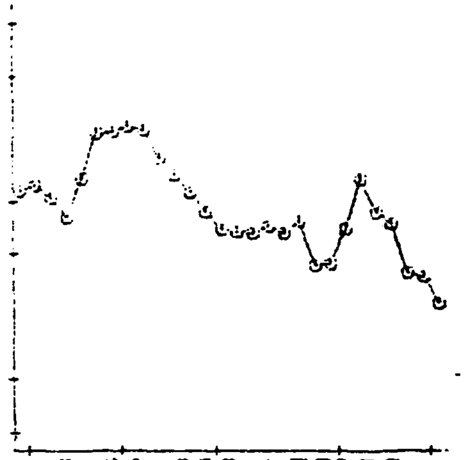
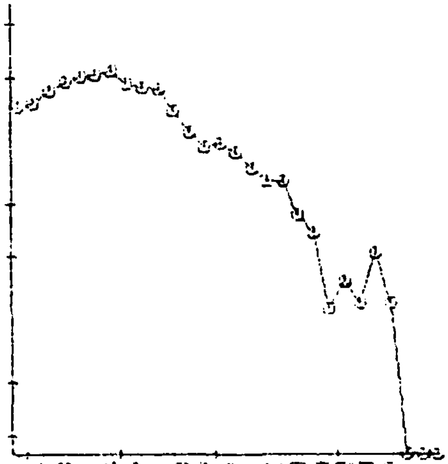


10-09 000 METERS



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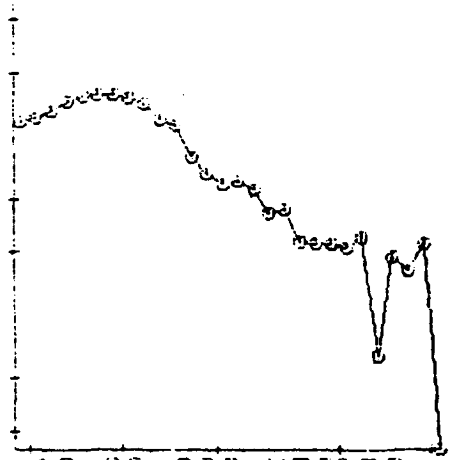
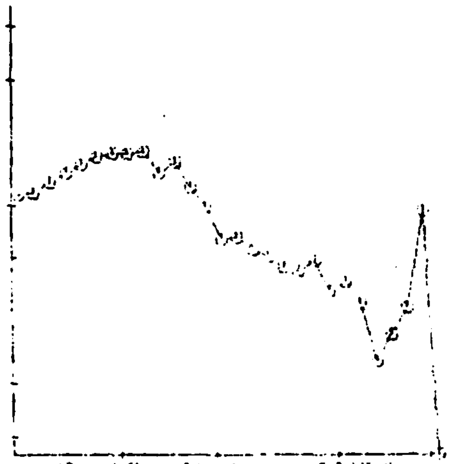


10-09 080 METERS



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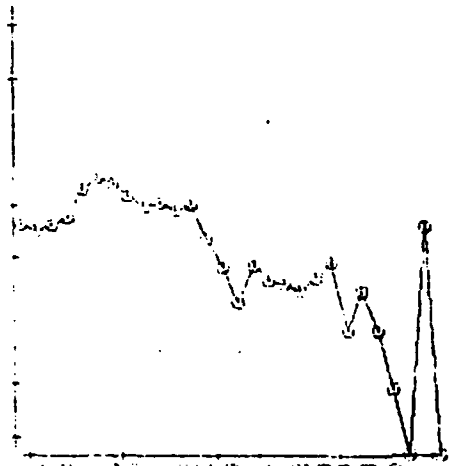
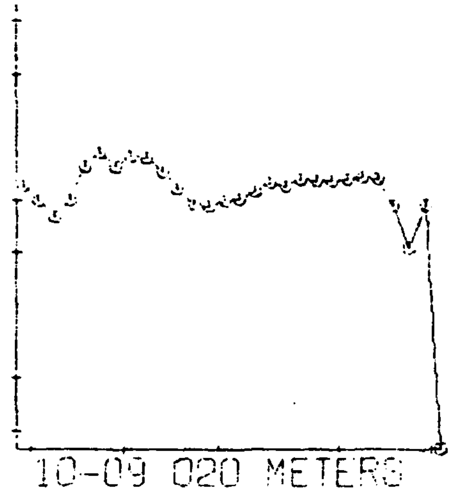
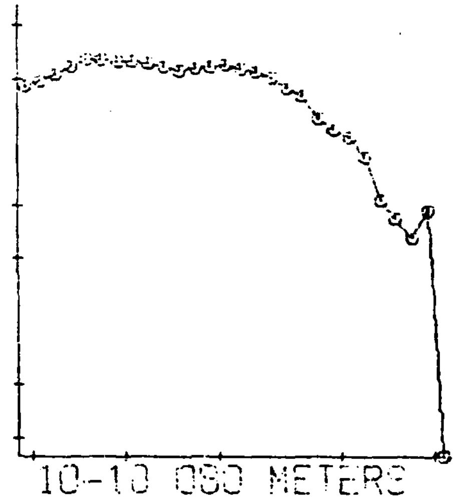


10-09 040 METERS


10-09 020 METERS


10-09 010 METERS


10-09 000 METERS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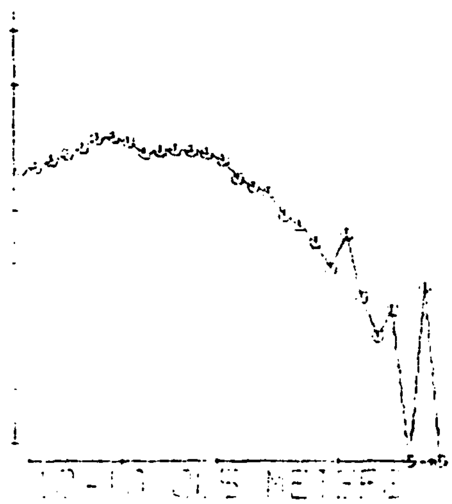
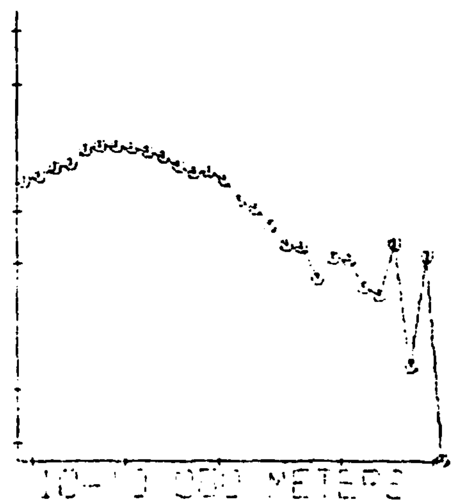
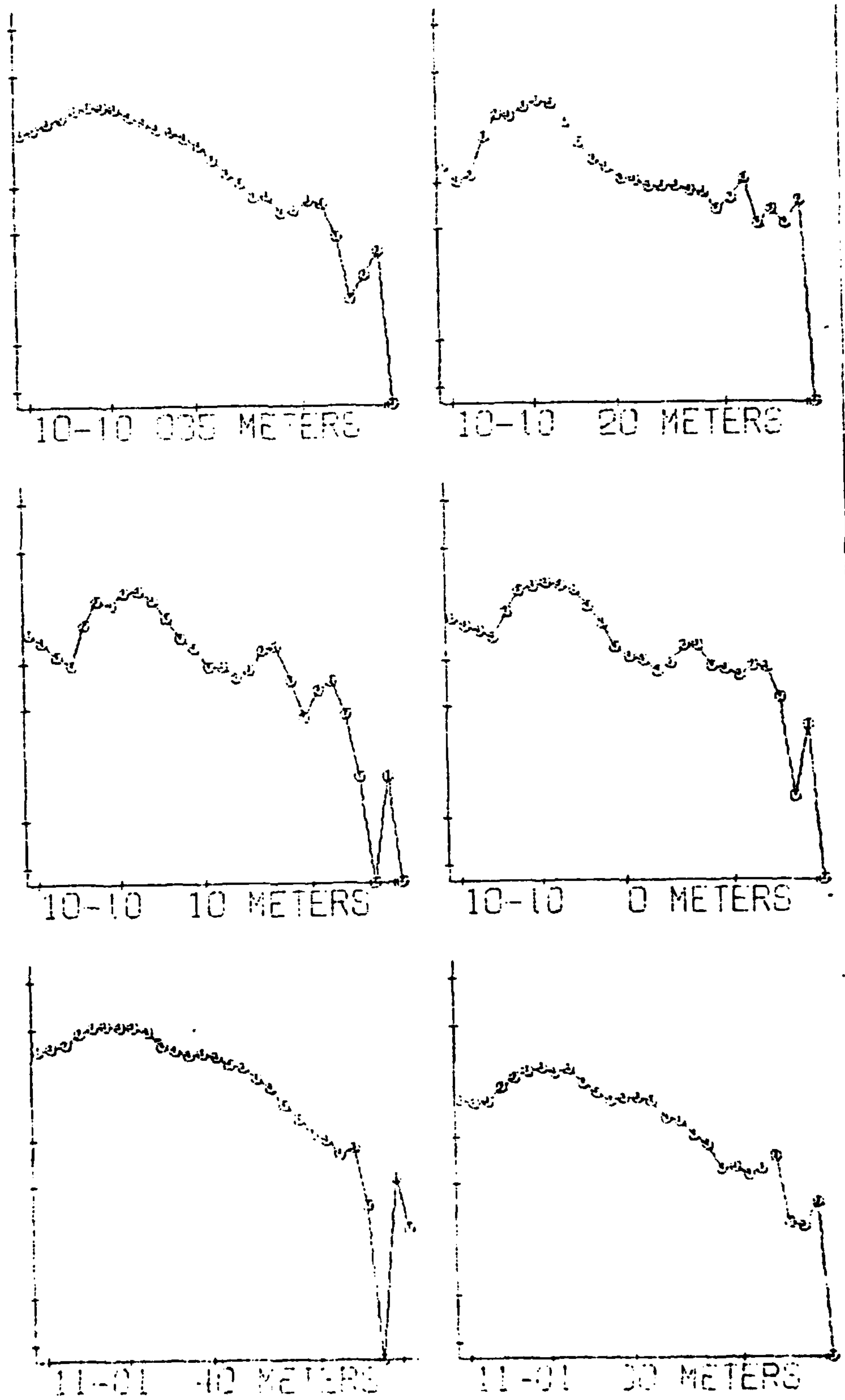
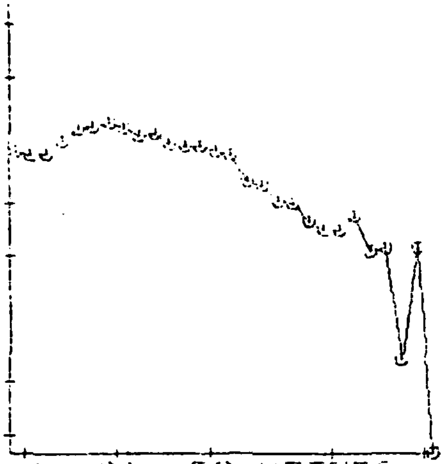
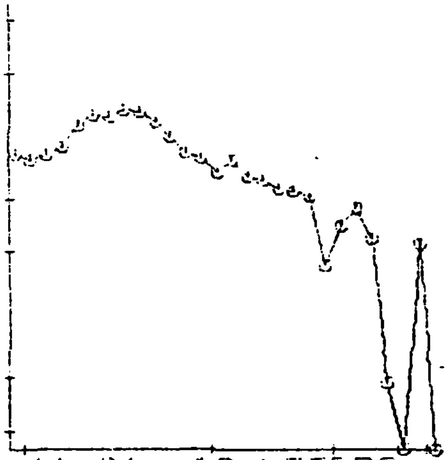





10-10 035 METERS
10-10 20 METERS
10-10 10 METERS
10-10 0 METERS
11-01 40 METERS
11-01 30 METERS


11-01 20 METERS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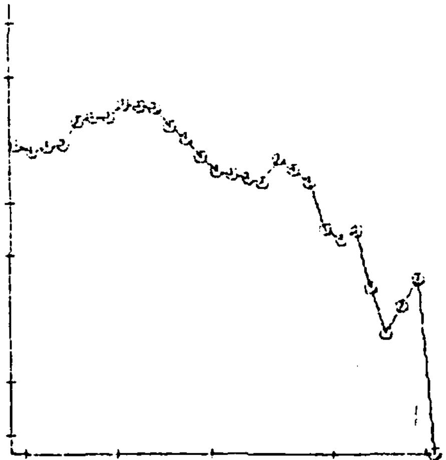
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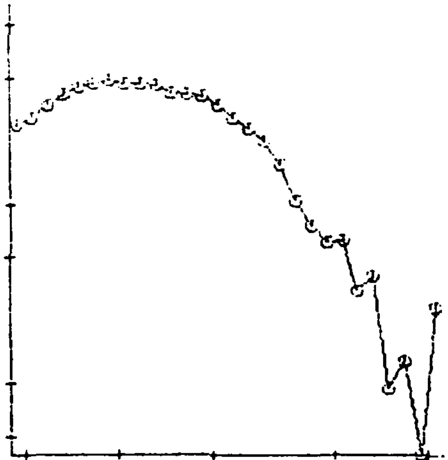
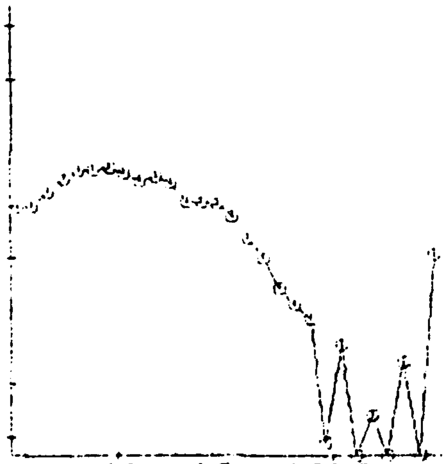

11-02 203 METERS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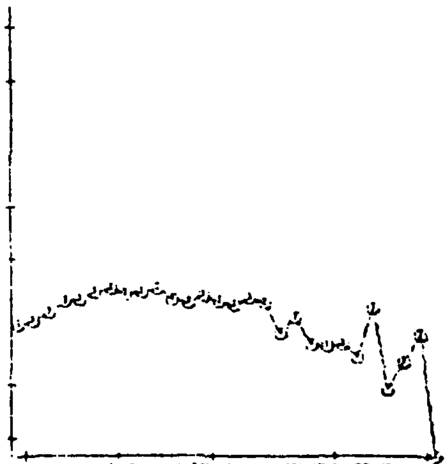
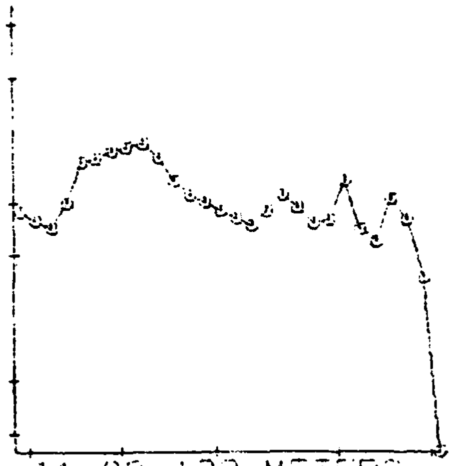
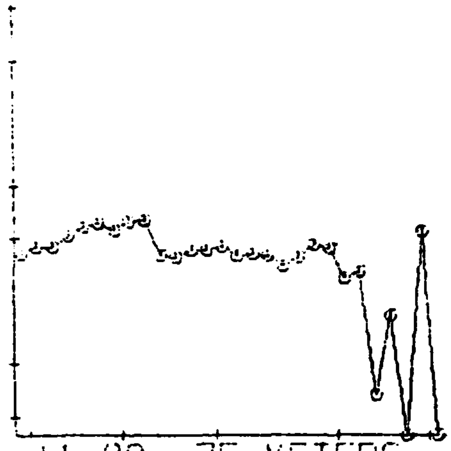
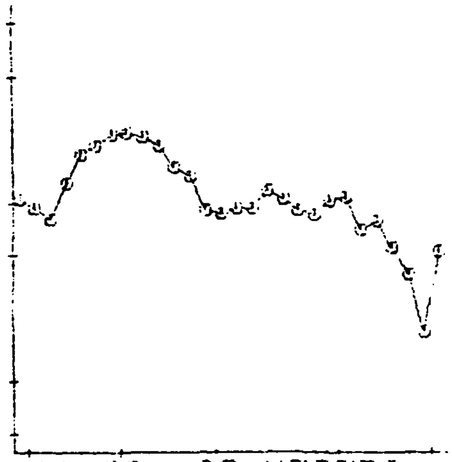

11-02 150 METERS



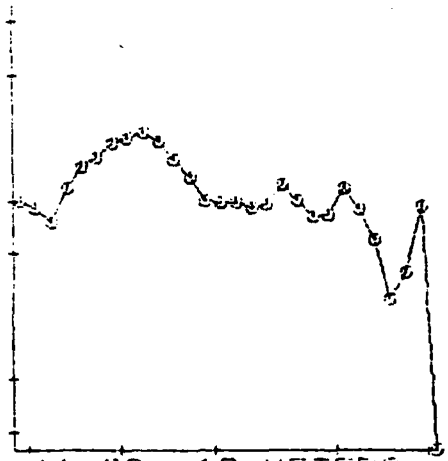
11-02 100 METERS



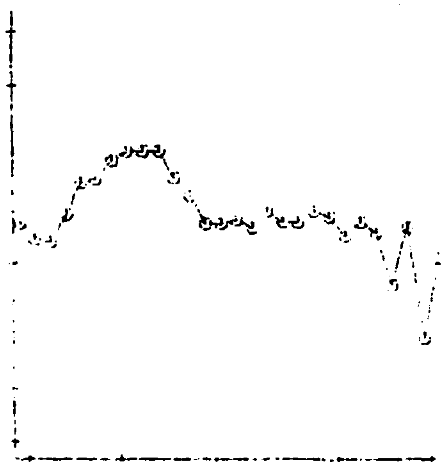
11-02 75 METERS



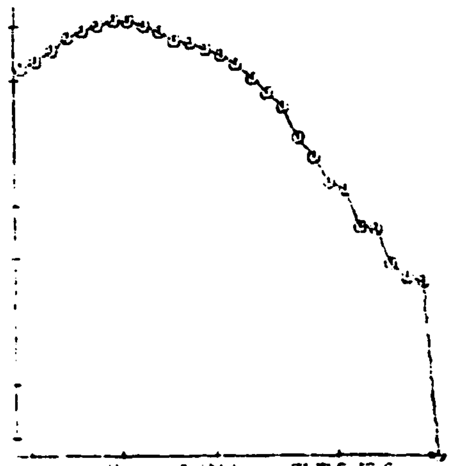
11-02 30 METERS



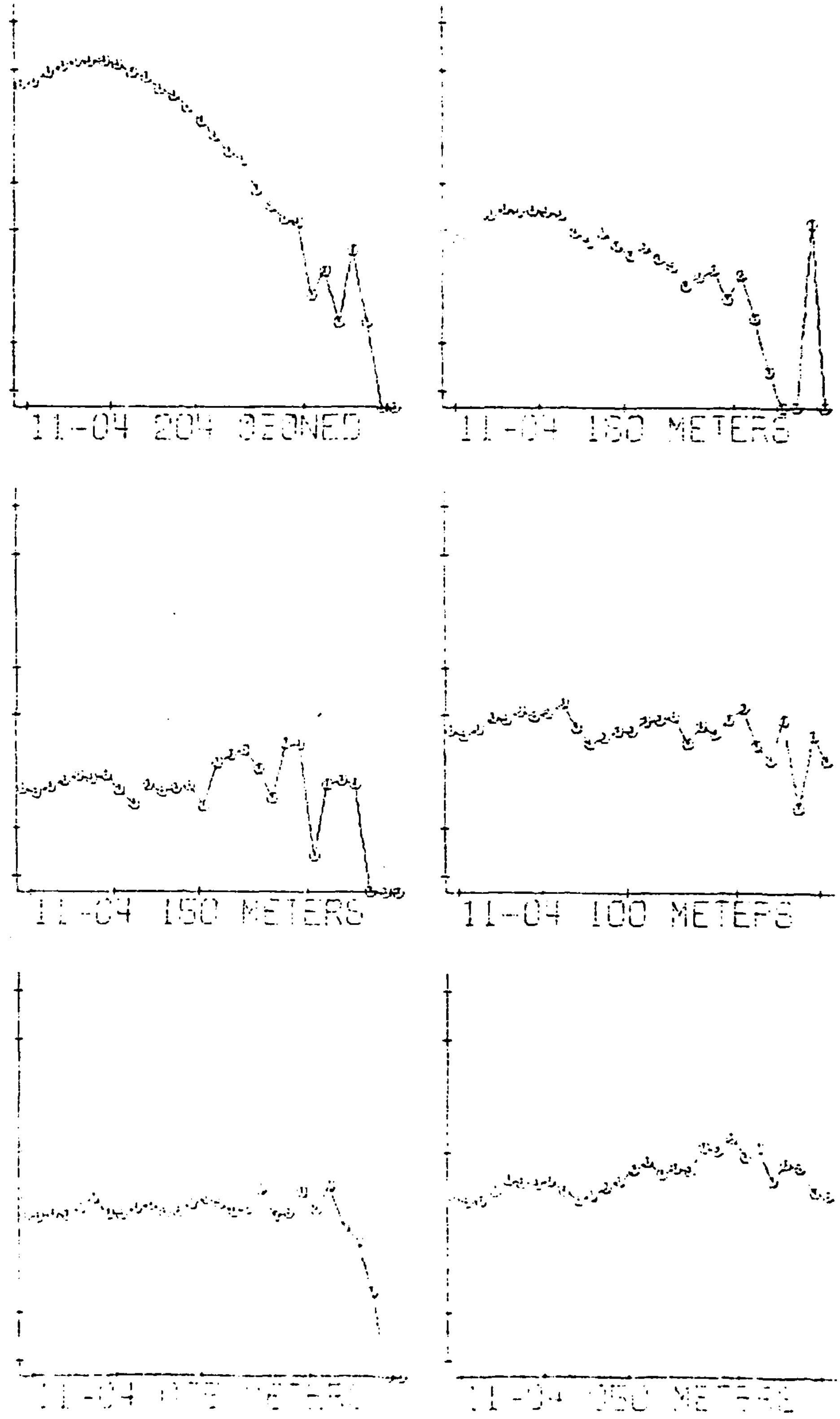
11-02 10 METERS

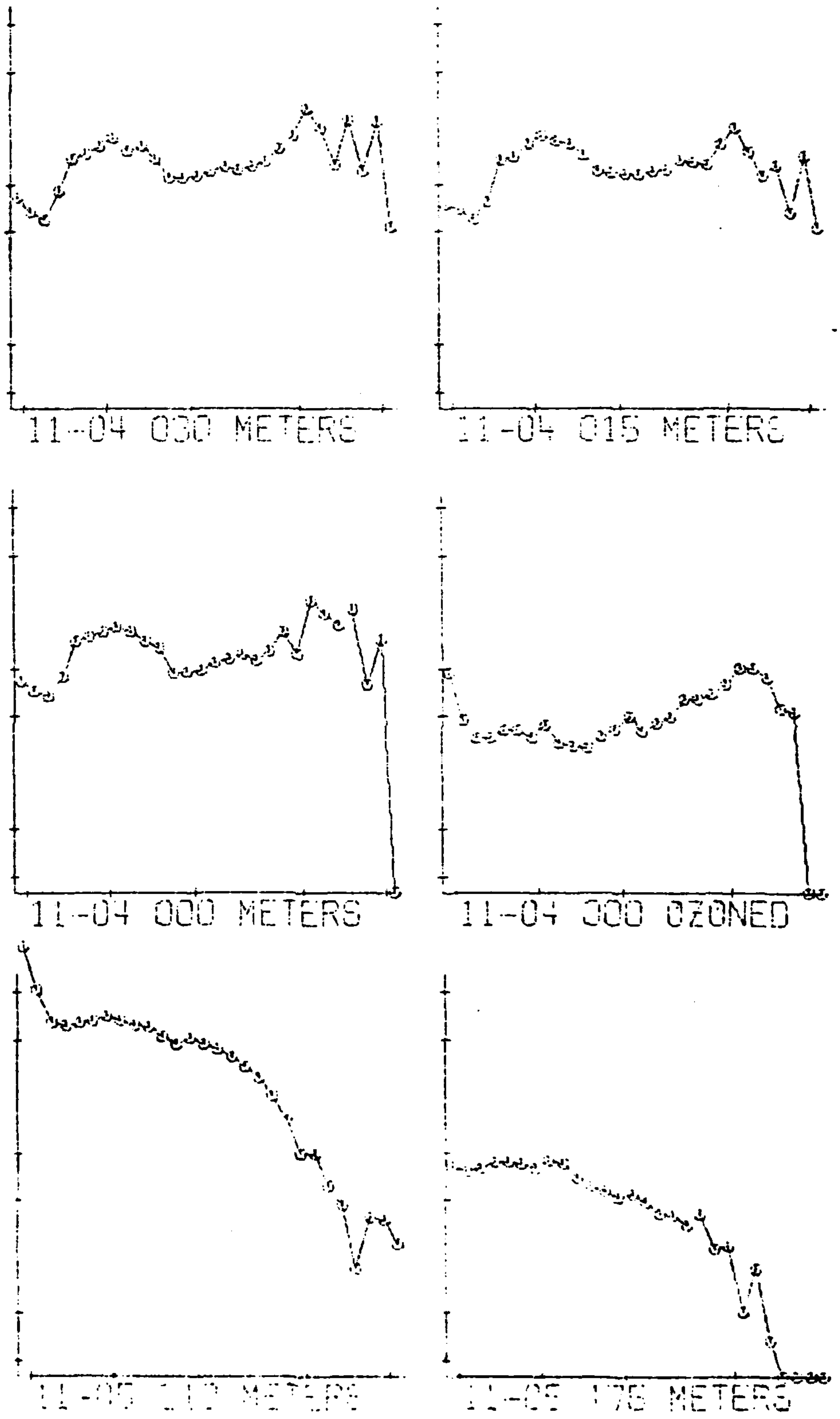


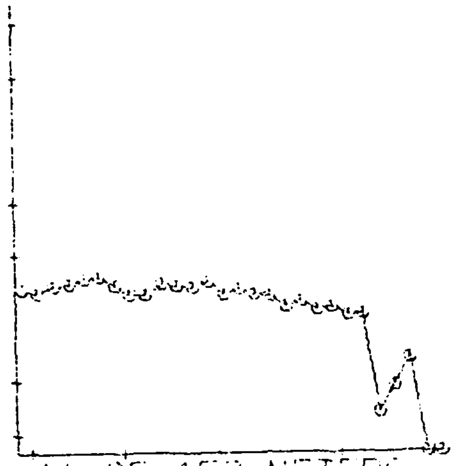
11-02 [illegible] METERS



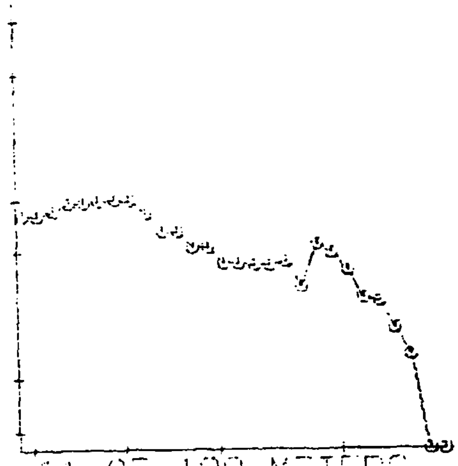
11-04 204 METERS


11-04 150 METERS
11-04 100 METERS

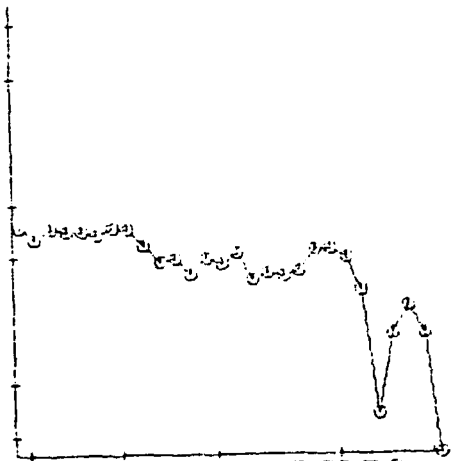

11-04 030 METERS
11-04 015 METERS
11-04 000 METERS
11-04 000 OZONED
11-05 176 METERS



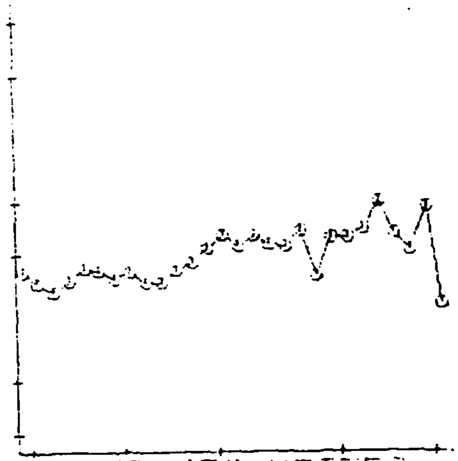
11-05 150 METERS



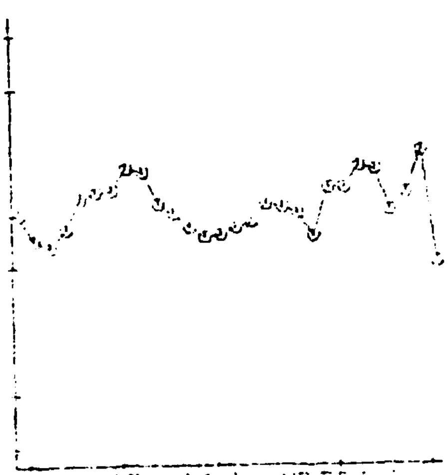
11-05 100 METERS



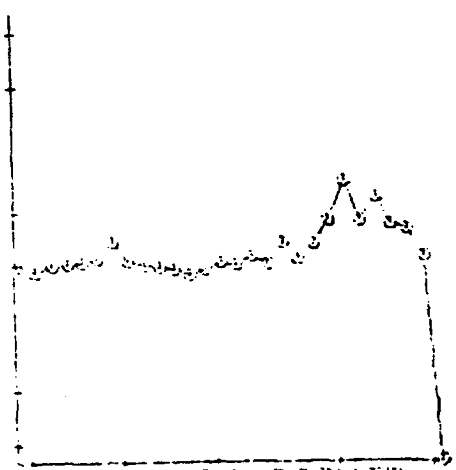
11-05 075 METERS



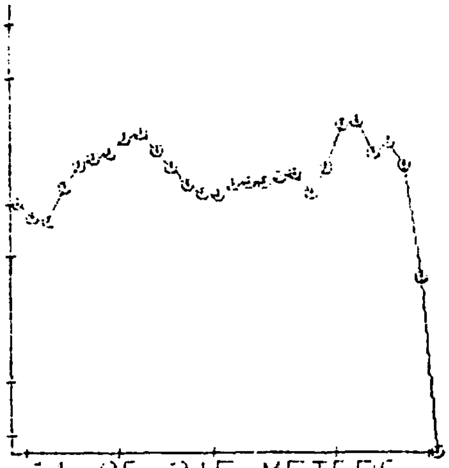
11-05 050 METERS



11-05 [illegible] METERS



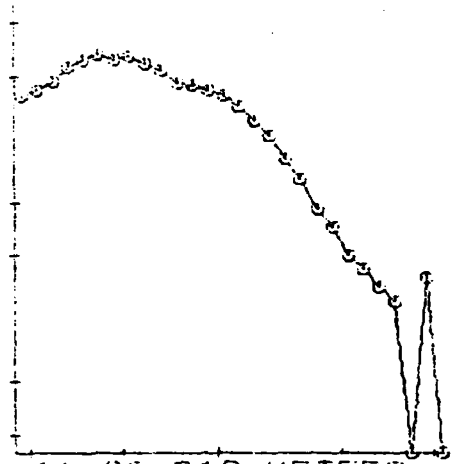
11-05 [illegible]



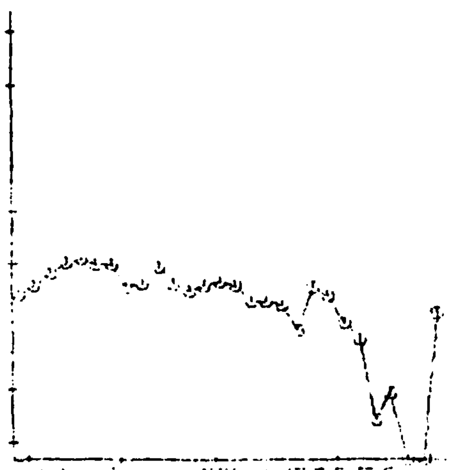
11-05 015 METERS

11-05 015 OZONED

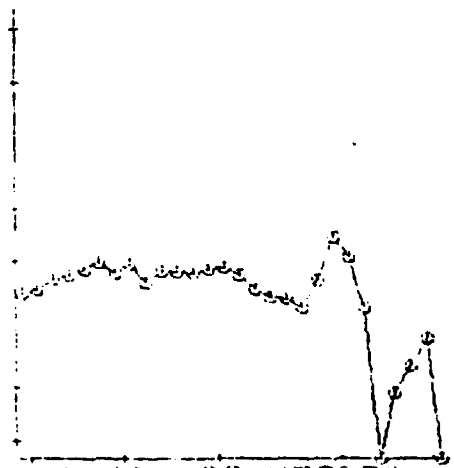
11-05 000 METERS



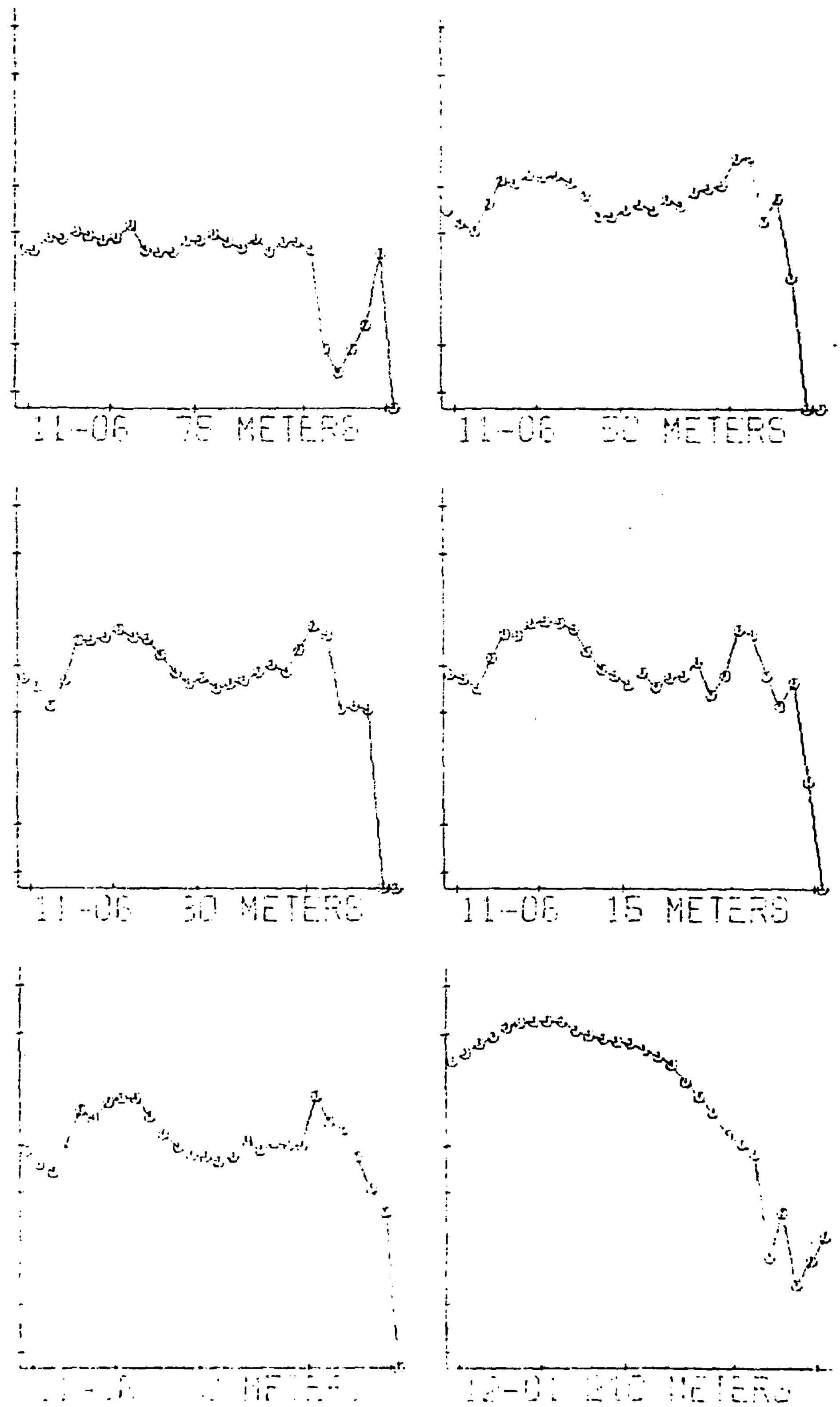
11-06 210 METERS



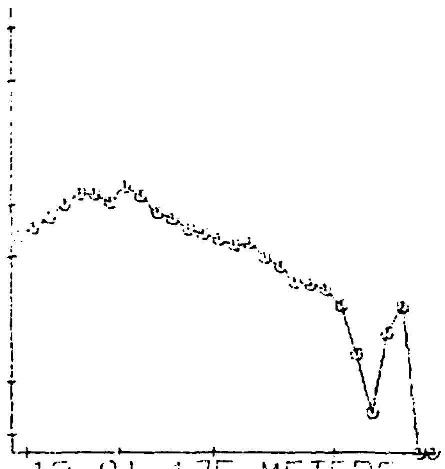
11-06 [illegible] METERS

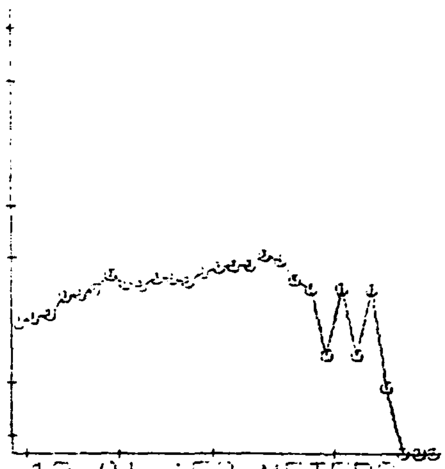


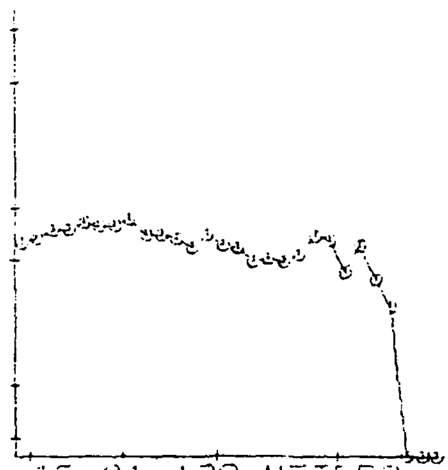
11-06 100 METERS

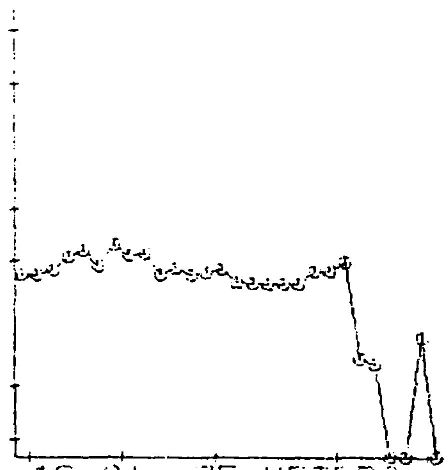


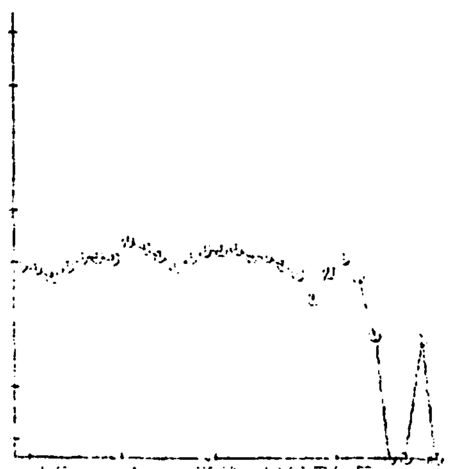
11-06 75 METERS
11-06 50 METERS
11-06 30 METERS
11-06 15 METERS

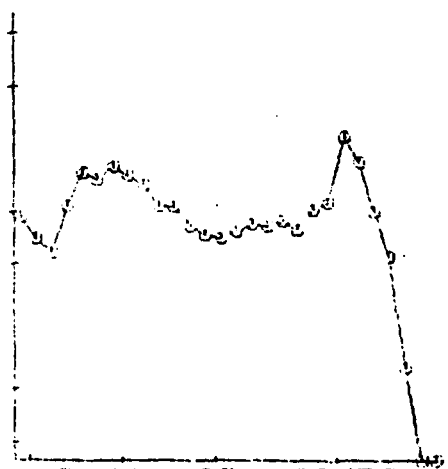

12-01 175 METERS

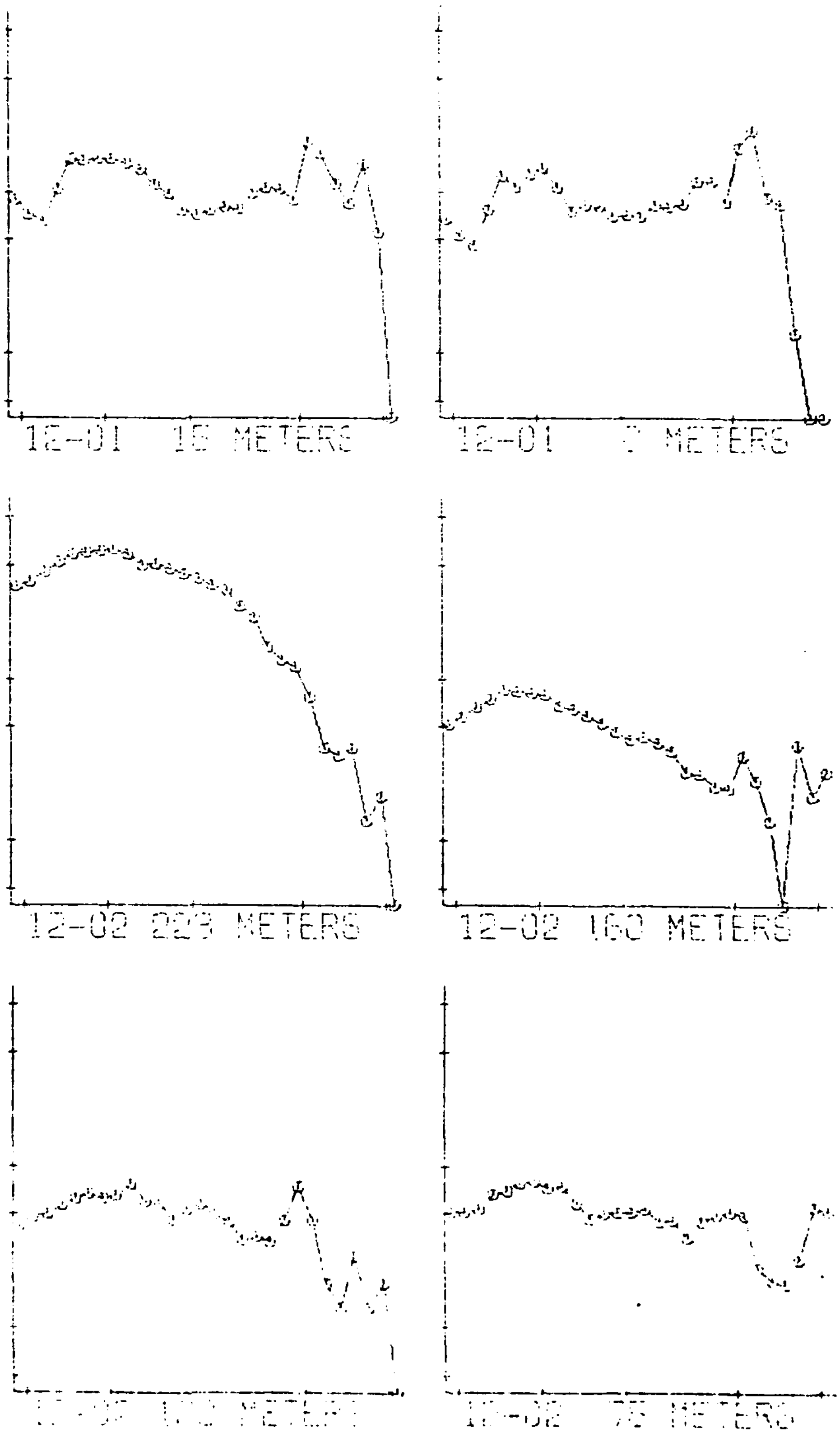

12-01 150 METERS


12-01 100 METERS

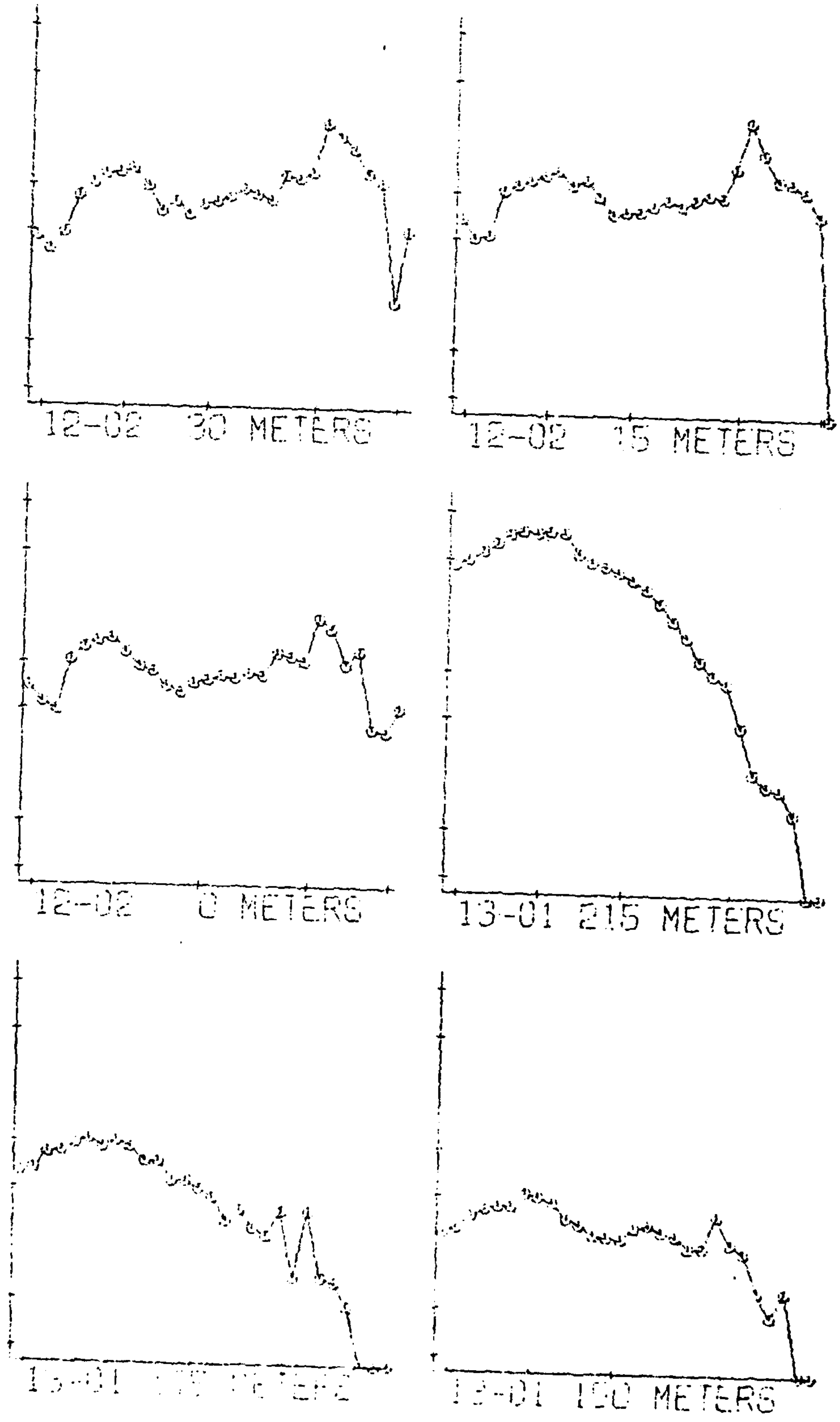

12-01 75 METERS

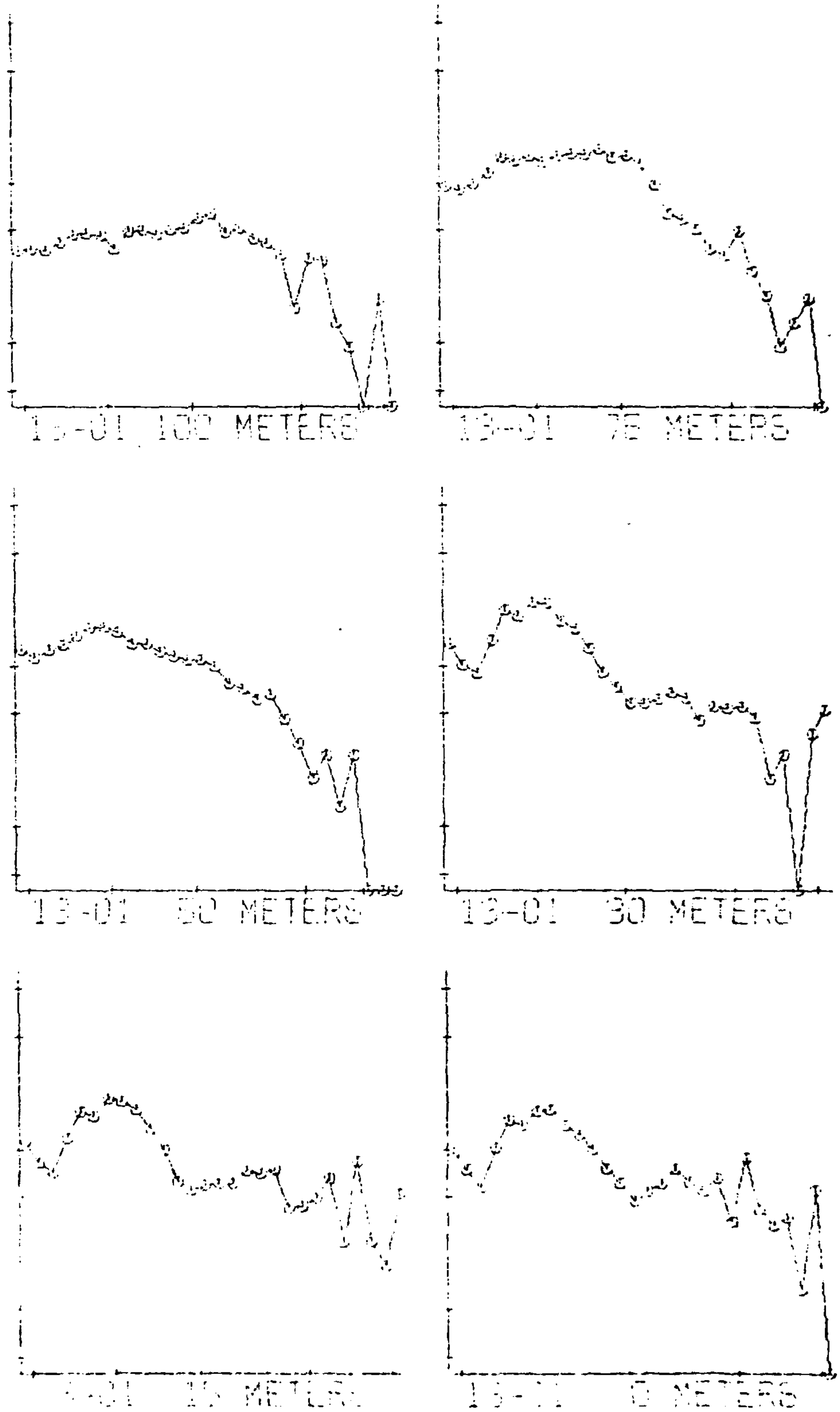



12-01 30 METERS



12-01 15 METERS
12-02 223 METERS
12-02 160 METERS


12-02 30 METERS
12-02 15 METERS
12-02 0 METERS
13-01 215 METERS
13-01 100 METERS


100 METERS
13-01 75 METERS
13-01 50 METERS
13-01 30 METERS
15 METERS
0 METERS

VOLUME SCATTERING FUNCTION

The volume scattering function was measured with a modified Brice Phoenix Light Scattering Photometer at angles of 45°, 90° and 135° at wavelengths 400, 450, 500 and 550 nm. The calibration procedure is given in (Zaneveld et al., 1978). The computation is made as follows:

$$\beta(\theta,\lambda) = G(\lambda)\,\frac{R(\theta,\lambda)}{R(0,\lambda)}\,\frac{f(0,\lambda)}{f(\theta,\lambda)}\,\sin(\theta)^{*}$$

where $G(\lambda)$ is a geometrical-electro-optical factor determined by the calibration procedure, $R(\theta,\lambda)$ is the Brice-Phoenix reading, $f(\theta,\lambda)$ is the filter factor for the combination of neutral density filers used, θ is the angle from the main beam and λ is the wavelength of the light. Readings at zero degrees are with the working standard in the light path. The working standard consists of a neutral density filter and opal glass. Spectral values for G and f are given below.

λ	G	f_1	f_2	f_3	f_4
400	1.062	.467	.213	.101	.042
450	1.428	.483	.235	.115	.055
500	1.665	.500	.246	.117	.058
550	1.785	.500	.250	.120	.061

REFERENCE

Zaneveld, J. R. V., J. C. Kitchen, R. Bartz, D. Menzies, S. Moore, R. Spinrad, and H. Pak. 1978. Optical, hydrographic and chemical observations in the Monterey Bay area during May and September 1977. Data Report. Reference 78-13, School of Oceanography, Oregon State University, Corvallis, Oregon. 216 pp.

* $\beta(135,\lambda)$ is adjusted to allow for reflection from the back wall of the cuvette by subtracting five percent of $\beta(45,\lambda)$ from it.

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SAMPLE ID	400 NANOMETERS B45	B90	B135	450 NANOMETERS B45	B90	B135	500 NANOMETERS B45	B90	B135	550 NANOMETERS B45	B90	B135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
06 09 300	487	122	177	352	84	118	335	59	95	291	44	75
06 09 250	543	134	175	459	90	122	475	79	102	382	57	76
06 09 200	389	114	153	397	72	104	307	59	82	256	44	56
06 09 150	444	126	179	352	84	123	363	79	94	309	60	81
06 09 100	463	155	164	307	78	117	293	59	83	271	43	72
06 09 075	395	110	185	283	72	186	251	59	113	201	39	93
06 09 050	521	122	264	388	84	166	251	59	155	311	55	112
06 09 025	724	134	220	451	96	148	454	99	131	422	59	104
06 09 000	724	134	157	555	96	100	587	79	68	462	66	77
07 01 350	2375	391	319	1983	313	233	2725	415	311	2446	315	199
07 01 250	1043	204	219	940	151	140	738	217	75	837	117	121
07 01 200	637	155	181	387	113	122	587	178	96	391	67	96
07 01 150	407	114	158	300	92	96	279	59	98	277	48	77
07 01 100	703	134	187	406	81	125	377	59	121	326	52	141
07 01 075	608	130	194	397	70	129	279	40	126	380	52	92
07 01 050	637	126	184	403	270	121	447	59	103	446	60	99
07 01 025	579	134	193	403	81	121	341	59	109	489	67	92
07 01 000	1082	151	165	487	103	117	511	99	128	478	117	98
07 02 225	699	161	193	583	120	152	627	114	129	503	81	101
07 02 200	531	112	165	338	77	124	390	56	105	344	51	81
07 02 150	422	110	157	361	81	118	358	66	91	328	46	73
07 02 100	228	91	149	261	67	107	233	44	99	271	34	58
07 02 075	360	91	147	345	74	119	296	66	94	269	34	74
07 02 050	311	91	150	252	65	111	252	45	98	189	35	68
07 02 025	556	83	173	476	23	106	426	67	105	341	57	93
07 02 000	479	110	154	463	28	91	425	21	39	304	50	76
07 03 175	2293	385	328	2026	309	246	1978	289	225	2002	261	202
07 03 150	1448	241	262	1313	206	198	1262	169	176	1258	170	153
07 03 125	2626	374	288	2322	309	248	2183	289	232	2053	265	178
07 03 100	2590	396	306	2273	325	268	2353	314	223	2155	257	188
07 03 075	326	92	151	297	63	109	222	49	91	219	61	78
07 03 050	312	87	144	254	55	110	205	48	75	209	35	70
07 03 025	412	108	154	359	63	111	324	48	86	259	44	79

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SAMPLE ID	400 NANOMETERS 045	090	0135	450 NANOMETERS 045	090	0135	500 NANOMETERS 045	090	0135	550 NANOMETERS 045	090	0135
				VOLUME SCATTERING FUNCTION (1/M) X 100000								
07 03 010	435	97	163	372	63	110	358	48	84	480	41	70
07 03 000	458	108	155	383	71	127	358	48	101	206	48	79
07 04 150	2727	411	341	2544	353	280	2265	315	240	1070	230	186
07 04 125	4638	813	569	4608	603	387	3949	551	383	3705	479	285
07 04 100	4267	583	423	3990	520	352	3397	499	313	2932	386	248
07 04 075	1561	272	259	1285	260	179	1189	184	153	1112	143	114
07 04 050	553	124	178	448	56	122	353	53	94	299	54	31
07 04 025	750	161	186	625	121	133	576	105	101	455	71	76
07 04 010	553	135	174	446	53	129	464	105	107	384	53	75
07 05 150	2619	393	246	2463	322	177	2384	323	278	2139	286	179
07 05 125	3764	493	347	3062	432	319	2824	253	348	2840	367	249
07 05 100	3732	512	364	3449	440	289	3245	415	220	2566	363	263
07 05 075	1805	244	211	1450	205	152	1590	230	-9	1315	177	133
07 05 050	843	134	169	573	110	132	717	92	111	590	77	121
07 05 025	492	115	138	397	81	99	391	92	78	366	50	72
07 05 010	475	110	145	407	73	104	397	69	110	301	62	73
07 05 000	628	110	120	419	81	103	464	92	107	340	52	65
07 06 115	3106	459	371	3034	402	290	2547	369	325	2282	322	215
07 06 100	2641	375	428	2555	325	335	2264	271	311	1893	233	253
07 06 075	855	146	207	745	120	162	778	98	153	683	69	113
07 06 050	986	151	157	720	103	109	679	98	88	544	81	74
07 06 025	563	106	158	463	94	116	418	74	101	386	47	79
07 06 010	1376	123	90	1260	103	64	1344	98	37	962	63	34
07 06 000	1672	129	114	1224	103	84	849	74	62	1089	54	34
07 07 100	2302	342	284	1523	232	178	1385	251	129	1244	175	150
07 07 075	2430	324	251	1643	238	116	1269	261	192	1784	161	85
07 07 050	3745	312	249	1523	187	188	1500	241	180	1178	145	107
07 07 025	1748	204	192	892	148	124	582	191	141	671	79	75
07 07 020	956	204	253	523	122	165	635	161	195	473	68	95
07 07 015	725	108	231	361	64	150	412	120	164	473	72	90
07 07 010	1453	264	231	920	148	149	894	161	154	1009	123	110
07 07 005	1344	252	255	910	142	141	880	151	141	892	114	108
07 08 057	1549	298	293	1483	234	217	1404	226	232	1385	175	131

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VOLUME SCATTERING FUNCTION (1/M) X 100000

SAMPLE ID	400 NANOMETERS			450 NANOMETERS			500 NANOMETERS			550 NANOMETERS		
	B45	B90	B135	B45	B90	B135	B45	B90	B135	B45	B90	B135
07 08 050	1797	365	316	1750	210	210	1571	126	149	1502	203	170
07 08 025	1439	254	257	1167	178	193	1209	151	153	1378	159	125
07 08 010	1540	243	259	1711	226	206	1547	201	207	1221	159	129
07 08 000	1614	331	294	1386	218	211	1369	176	198	986	159	142
07 09 150	1701	278	290	1336	191	209	1207	238	199	1308	184	154
07 09 100	3870	570	428	3702	497	324	3231	454	312	3060	402	256
07 09 075	2627	390	336	2334	329	263	2175	281	212	1999	281	172
07 09 050	491	111	169	346	77	129	290	43	92	261	44	82
07 09 030	514	116	175	437	86	130	443	65	109	739	52	91
07 09 020	514	111	168	471	77	128	367	65	89	438	45	76
07 09 010	683	157	191	571	107	139	504	86	112	497	75	88
07 09 000	521	147	185	493	130	159	474	239	206	420	65	94
07 10 150	1732	235	269	1199	203	185	1113	178	165	1114	169	139
07 10 100	1947	197	216	1066	188	181	909	230	239	810	119	105
07 10 075	916	192	232	804	181	173	772	268	229	653	89	97
07 10 050	296	128	168	303	68	119	268	45	97	217	46	76
07 10 030	478	113	150	398	75	108	347	45	77	302	48	68
07 10 020	470	109	151	396	75	109	347	45	77	319	48	67
07 10 010	567	104	146	410	75	107	347	45	77	302	44	65
07 10 000	479	104	147	378	87	109	426	156	136	331	44	65
08 01 150	1293	227	200	1199	218	163	1474	334	147	958	115	117
08 01 100	5923	644	376	4920	592	349	6573	759	176	3279	460	254
08 01 075	573	108	139	430	83	127	449	67	198	262	46	67
08 01 050	306	95	124	291	62	92	221	45	69	154	28	48
08 01 030	665	182	134	473	128	131	662	245	188	422	77	59
08 01 020	806	143	148	617	98	118	536	89	99	570	69	60
08 01 010	1031	113	109	928	83	71	897	67	50	741	48	31
08 01 000	247	123	172	261	83	152	347	89	219	365	52	84
08 02 150	2033	316	257	1734	286	233	1282	312	251	1378	206	151
08 02 100	3621	507	349	3256	420	322	2695	312	307	2758	335	221
08 02 075	1915	173	190	951	150	149	897	111	113	696	97	105
08 02 050	262	74	119	298	53	81	173	22	54	165	24	59
08 02 030	258	94	125	297	68	81	236	45	57	240	34	37

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SAMPLE ID	400 NANOMETERS B45	B90	B135	450 NANOMETERS B45	B90	B135	500 NANOMETERS B45	B90	B135	550 NANOMETERS B45	B90	B135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
08 02 020	463	104	120	418	75	91	379	45	60	308	38	52
08 02 010	388	89	120	374	68	82	378	45	60	297	40	48
08 02 000	455	89	120	374	68	93	347	45	61	297	36	58
08 03 150	1397	230	226	1313	203	197	1126	187	175	1021	153	137
08 03 100	4055	564	396	4066	548	367	4246	562	351	3242	408	245
08 03 075	3529	481	370	3471	444	294	3397	281	128	2634	340	227
08 03 050	449	85	105	319	70	83	265	47	79	340	30	41
08 03 030	402	105	125	354	47	92	331	47	83	243	41	53
08 03 020	394	70	143	388	55	113	431	70	127	350	56	57
08 03 010	479	105	157	547	70	116	431	47	79	255	47	90
08 03 000	485	95	128	445	86	99	431	47	78	280	37	50
08 04 150	1314	238	207	1101	183	189	1003	215	178	1107	151	101
08 04 100	2530	304	226	2163	256	210	1793	236	199	2069	278	174
08 04 075	2103	297	252	2104	296	188	1541	215	176	1708	212	151
08 04 050	315	83	118	264	63	85	243	64	66	234	37	52
08 04 030	357	60	110	289	63	55	258	43	63	248	35	48
08 04 020	413	102	139	353	42	67	380	64	72	390	53	57
08 04 010	581	148	154	577	106	115	532	107	95	474	67	85
08 04 000	462	116	147	412	84	114	389	86	103	306	49	70
08 05 150	1261	212	187	1142	177	135	951	143	125	966	152	112
08 05 100	1261	221	190	1179	202	160	1066	306	249	1116	145	107
08 05 075	1818	309	246	1812	247	182	1642	224	177	1553	189	151
08 05 050	319	91	124	250	57	90	230	41	75	178	30	55
08 05 030	369	87	125	333	51	104	360	61	83	268	41	60
08 05 020	425	103	128	389	114	119	418	224	181	304	47	61
08 05 010	400	99	135	389	120	119	447	224	208	294	45	59
08 05 000	456	111	129	379	76	102	389	81	96	299	48	61
08 06 150	1144	221	205	984	154	141	922	143	127	985	141	117
08 06 100	1054	210	197	965	154	151	893	153	143	892	127	114
08 06 075	2229	345	270	2012	308	226	1988	428	304	1813	239	162
08 06 050	294	87	125	236	71	97	259	61	88	180	32	58
08 06 030	325	95	127	239	71	98	288	61	191	247	42	59
08 06 020	443	87	132	358	77	109	403	81	95	333	49	63

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SAMPLE ID	400 NANOMETERS 845	400 NANOMETERS 890	400 NANOMETERS 8135	450 NANOMETERS 845	450 NANOMETERS 890	450 NANOMETERS 8135	500 NANOMETERS 845	500 NANOMETERS 890	500 NANOMETERS 8135	550 NANOMETERS 845	550 NANOMETERS 890	550 NANOMETERS 8135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
08 06 010	425	99	128	376	80	113	375	61	97	338	47	62
08 06 002	431	99	130	385	77	103	389	61	95	355	44	59
08 07 150	1202	210	182	1239	186	160	1288	183	137	935	137	106
08 07 100	3339	459	314	3348	452	302	3448	448	299	2954	357	261
08 07 075	275	87	103	348	71	82	403	102	81	236	34	47
08 07 050	281	95	106	319	71	79	288	61	72	322	40	42
08 07 030	425	91	113	367	77	95	346	81	84	360	55	59
08 07 020	493	99	115	479	64	85	634	61	55	397	49	49
08 07 010	452	95	120	386	71	94	351	61	69	317	46	67
08 07 000	406	87	108	338	71	83	375	61	68	322	42	52
08 08 150	1642	295	230	1559	263	213	1874	295	223	1611	194	113
08 08 100	3796	451	279	3693	452	257	3162	469	245	2775	349	221
08 08 075	1642	161	186	1639	225	172	1113	183	146	1343	175	126
08 08 050	237	50	102	216	51	75	173	41	49	142	39	45
08 08 030	425	78	95	310	51	70	288	41	43	246	32	49
08 08 020	356	78	105	404	51	75	274	41	44	290	40	45
08 08 010	456	91	111	357	66	82	375	41	68	312	44	54
08 08 000	549	78	93	714	58	60	410	41	52	279	38	48
08 09 150	1871	289	243	1414	150	183	1772	138	210	1675	177	124
08 09 100	1525	235	229	1080	168	158	874	134	171	1107	148	109
08 09 075	1672	291	241	1505	242	184	1584	221	195	1089	150	142
08 09 050	503	106	125	300	59	78	274	55	65	266	38	48
08 09 030	409	106	138	461	66	75	469	28	55	373	40	53
08 09 020	502	118	141	242	66	97	791	55	78	349	60	60
08 09 010	659	112	121	441	73	50	645	55	124	405	40	72
08 09 000	725	174	178	729	124	124	704	249	219	481	65	74
08 10 150	1197	195	228	1086	159	174	1057	169	169	949	126	127
08 10 100	998	170	132	793	69	171	1706	145	154	697	86	115
08 10 075	1815	343	296	1593	241	218	1449	217	217	1457	194	164
08 10 050	402	135	178	330	83	132	324	48	103	300	55	88
08 10 030	508	120	176	485	98	135	477	72	113	412	60	90
08 10 010	622	125	189	562	90	137	580	72	124	524	64	96
08 10 000	667	135	190	617	98	139	580	72	124	549	73	99
08 11 150	1997	354	330	1640	248	237	2149	289	285	1483	216	148
070HF 150	341	105	156	297	75	113	273	72	106	225	42	76
08 11 100	1231	250	265	1041	158	155	1006	145	137	1036	137	142

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SAMPLE ID	400 NANOMETERS B45	B90	B135	450 NANOMETERS B45	B90	B135	500 NANOMETERS B45	B90	B135	550 NANOMETERS B45	B90	B135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
08 11 075	251	60	136	207	60	95	222	48	74	165	31	64
08 11 050	402	95	143	420	83	117	443	72	97	377	40	57
08 11 030	539	119	136	496	90	119	512	96	111	431	60	77
08 11 020	590	130	171	617	105	139	580	95	124	493	68	91
08 11 010	638	130	163	694	135	136	631	72	122	587	68	74
08 12 150	2019	315	243	1756	228	197	1525	228	188	1531	205	163
08 12 100	363	93	143	334	67	116	308	62	102	301	41	74
08 12 075	268	76	129	216	54	103	176	41	79	164	30	74
08 12 050	283	72	131	247	54	102	220	41	77	211	30	70
08 12 030	459	59	129	413	60	117	396	62	83	340	47	79
08 12 020	459	88	138	422	60	112	425	62	81	384	43	73
08 12 010	446	98	132	413	67	108	396	62	83	356	49	75
08 12 000	484	97	157	472	74	109	454	62	95	378	59	80
09 01 150	1933	313	241	1961	257	189	1909	230	175	1550	180	129
09 01 100	2444	369	321	2378	343	257	2350	307	226	2025	263	193
09 01 075	443	103	145	380	62	108	307	51	93	264	45	62
09 01 050	225	82	123	248	62	87	109	51	67	91	32	52
09 01 030	528	77	130	352	55	98	470	51	57	348	45	52
09 01 020	620	108	118	547	86	66	415	51	89	420	51	58
09 01 010	923	123	125	563	86	104	596	77	79	438	62	59
09 01 000	698	118	143	694	78	113	524	77	109	510	57	64
09 02 150	1124	216	108	1031	171	152	1028	153	129	852	115	92
09 02 100	664	113	130	680	47	93	524	77	82	408	45	58
09 02 075	341	97	143	319	70	89	253	51	60	213	38	48
09 02 050	529	118	144	490	93	102	253	51	60	213	57	67
09 02 030	579	123	196	593	93	152	325	77	146	408	57	[illegible]
09 02 020	562	103	150	445	70	121	415	77	89	438	57	71
09 02 010	630	128	164	516	93	134	542	102	117	444	64	77
09 02 000	903	97	125	1116	70	104	759	77	70	456	62	63
09 03 150	1465	236	192	1594	203	157	1395	204	147	1150	144	98
09 03 100	579	92	152	422	93	128	325	77	110	354	55	78
09 03 075	261	82	118	215	55	88	163	51	64	165	25	49
09 03 050	334	97	139	310	70	100	325	51	74	228	38	59
09 03 030	759	154	108	750	148	139	1175	281	194	420	72	75
09 03 020	715	113	124	750	86	84	434	77	69	414	55	59
09 03 010	567	144	164	639	190	139	470	102	121	468	58	73
09 03 000	647	128	131	539	101	94	734	128	90	378	57	52

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SAMPLE ID	400 NANOMETERS B45	B90	B135	450 NANOMETERS B45	B90	B135	500 NANOMETERS B45	B90	B135	550 NANOMETERS B45	B90	B135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
09 04 150	1561	264	213	1396	256	185	1404	189	147	1197	187	126
09 04 100	298	55	102	235	62	81	234	47	72	194	26	49
09 04 075	223	55	105	225	55	82	184	47	74	158	20	43
09 04 050	391	96	118	250	111	115	267	47	70	194	32	51
09 04 030	381	96	139	308	62	83	301	47	69	259	42	59
09 04 020	471	96	122	426	62	91	434	71	79	349	52	59
09 04 010	435	91	117	456	83	103	535	71	90	344	46	55
09 04 000	512	119	139	476	83	99	518	71	91	406	68	66
09 05 048	3351	534	389	2870	425	311	2845	447	287	2735	378	244
09 05 040	3105	534	370	2777	384	257	2439	351	262	2026	321	227
09 05 030	1922	298	250	1622	239	212	1513	224	173	1362	212	151
09 05 020	997	215	200	895	145	146	958	128	115	843	103	83
09 05 010	1008	194	195	880	145	132	858	128	115	778	106	89
09 05 000	1029	194	208	971	166	157	926	160	134	1077	112	96
09 06 083	2976	451	306	2597	349	227	2216	338	237	2389	344	227
09 06 070	1212	229	189	1138	175	156	956	154	148	1019	135	102
09 06 060	525	118	140	452	87	108	434	92	87	366	62	73
09 06 050	459	105	135	370	78	105	369	61	90	291	48	67
09 06 040	543	118	152	487	97	113	500	92	84	430	59	70
09 06 030	450	105	139	466	87	100	456	61	86	406	54	69
09 06 015	553	118	139	494	97	106	478	92	85	251	56	69
09 06 000	553	119	130	398	97	110	478	61	95	414	62	67
09 07 090	2457	371	304	2524	318	255	2473	307	224	2100	265	181
09 07 075	1084	186	172	929	154	145	971	123	125	844	104	91
09 07 060	978	198	187	900	154	146	826	154	133	813	104	87
09 07 050	978	141	168	755	106	133	521	92	104	454	79	91
09 07 040	574	134	139	464	87	106	413	61	89	350	48	72
09 07 030	893	154	168	847	125	135	782	92	117	701	90	98
09 07 015	893	147	164	842	106	122	673	92	118	621	79	82
09 08 115	2639	403	275	2645	354	209	2473	369	191	2117	294	164
09 08 100	2321	250	237	2015	273	207	1943	277	207	2181	215	145
09 08 075	595	122	133	517	91	88	530	61	82	393	52	61
09 08 030	659	128	148	547	111	123	565	92	80	477	60	70
09 08 015	616	154	141	608	162	105	530	61	82	495	63	58
09 08 000	595	115	133	578	91	107	565	61	80	477	63	59

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SAMPLE ID	400 NANOMETERS			450 NANOMETERS			500 NANOMETERS			550 NANOMETERS		
	045	090	0135	045	090	0135	045	090	0135	045	090	0135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
09 09 150	1636	224	212	1666	195	185	1456	215	144	1289	184	134
09 09 140	1105	173	171	1111	154	147	618	123	165	825	114	95
09 09 110	2824	416	284	2774	379	253	2785	338	100	2400	321	202
09 09 075	223	83	125	174	62	100	199	31	81	169	32	62
09 09 050	531	115	136	494	92	99	353	61	91	404	52	64
09 09 030	456	102	131	390	72	96	391	61	89	378	50	64
09 09 010	701	109	110	617	82	78	530	61	61	478	50	54
09 09 000	456	96	127	390	62	96	391	61	67	355	47	63
09 10 165	2290	380	284	1934	284	212	1097	333	226	1958	259	173
09 10 130	1179	204	192	965	152	138	857	121	129	892	121	107
09 10 100	330	99	137	244	61	88	214	30	75	207	37	65
09 10 075	321	92	137	258	61	88	236	61	74	311	62	62
09 10 050	260	85	113	208	71	76	193	61	76	143	34	51
09 10 030	395	92	120	359	81	104	343	91	90	307	42	52
09 10 020	489	105	124	330	61	91	386	61	66	327	45	51
09 10 010	499	118	134	344	81	76	343	61	69	315	59	62
09 10 000	468	118	139	352	71	97	364	61	67	311	54	64
10 01 190	2297	358	270	2114	291	196	2005	304	210	1803	259	170
10 01 150	506	130	141	370	87	105	406	101	99	352	54	67
10 01 125	365	87	117	341	69	86	334	34	55	264	39	53
10 01 100	263	74	101	247	48	77	191	34	62	213	31	41
10 01 050	245	69	102	219	48	71	215	34	61	154	26	44
10 01 030	395	50	96	356	69	78	358	67	78	268	31	45
10 01 020	354	87	109	336	79	79	334	67	79	253	49	55
10 01 010	372	87	113	343	68	96	374	67	73	208	36	62
10 01 000	365	80	113	350	78	99	430	67	74	279	41	48
10 02 254	422	133	145	351	81	97	306	67	79	323	65	65
10 02 200	480	127	160	437	81	107	424	67	96	339	52	68
10 02 150	355	89	126	272	61	94	259	33	81	300	35	62
10 02 100	278	32	121	229	61	89	282	67	80	175	24	59
10 02 075	246	76	118	222	51	89	235	33	82	141	24	60
10 02 050	278	75	116	229	61	96	235	33	82	166	27	67
10 02 030	393	95	142	365	71	194	447	67	95	296	33	64

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SAMPLE ID	400 NANOMETERS			450 NANOMETERS			500 NANOMETERS			550 NANOMETERS		
	B45	B90	B135	B45	B90	B135	B45	B90	B135	B45	B90	B135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
10 02 015	408	101	145	423	152	144	329	67	78	289	44	68
10 02 010	422	89	109	356	71	90	282	67	90	304	38	54
10 03 300	246	89	122	291	61	90	165	33	62	152	30	50
10 03 250	403	89	119	267	71	87	235	33	82	189	33	52
10 03 200	309	89	123	258	61	87	259	33	58	204	35	51
10 03 150	326	101	145	282	71	108	282	33	104	258	33	72
10 03 100	336	89	127	282	61	93	282	33	80	177	33	62
10 03 075	368	95	134	351	71	97	329	33	78	243	44	53
10 03 050	403	89	128	282	61	101	188	33	61	204	33	59
10 03 030	432	101	135	430	91	100	424	67	73	362	49	65
10 03 010	499	109	132	430	81	100	424	67	73	400	46	61
10 03 000	519	108	135	460	81	106	424	67	73	408	52	66
10 04 290	514	90	128	409	75	92	440	69	76	348	51	60
10 04 250	504	122	142	478	84	101	342	69	56	371	51	69
10 04 200	349	93	127	246	47	87	196	35	64	193	32	60
10 04 150	281	83	113	224	56	74	220	69	62	174	40	46
10 04 100	303	77	80	211	47	63	122	35	57	178	32	44
10 04 075	326	77	83	224	47	68	220	35	62	167	29	50
10 04 050	290	77	112	204	47	75	122	35	67	153	27	49
10 04 030	398	96	157	349	75	121	293	69	108	250	51	82
10 04 010	514	122	146	494	84	100	513	59	97	424	56	62
10 04 000	494	109	134	423	84	104	342	104	130	409	59	61
10 05 180	3725	502	350	3549	447	297	2498	553	265	2887	427	260
10 05 150	760	155	181	769	134	143	559	119	140	675	97	93
10 05 100	355	89	160	284	78	120	251	40	99	195	35	79
10 05 075	492	118	178	376	89	147	335	79	123	244	41	92
10 05 050	693	111	143	621	79	110	559	79	112	409	44	69
10 05 030	671	148	170	580	101	121	559	79	112	524	63	72
10 05 010	492	133	179	507	89	125	559	79	112	471	60	81
10 05 000	637	125	156	523	89	115	614	79	109	480	66	78
10 06 165	2409	370	309	2176	307	220	2029	347	255	2018	242	167
10 06 140	1493	253	247	1341	208	185	1271	199	182	1311	176	143
10 06 120	1283	234	214	1088	178	170	1182	158	142	1043	144	117

CRUISE W7711A NOV. 1977

VOLUME SCATTERING FUNCTION (1/M) X 100000

SAMPLE ID	400 NANOMETERS 045	090	0135	450 NANOMETERS 045	090	0135	500 NANOMETERS 045	090	0135	550 NANOMETERS 045	090	0135
10 06 100	1105	185	184	914	149	143	936	126	132	820	109	194
10 06 075	298	86	129	231	59	96	201	32	79	164	29	59
10 06 050	299	92	125	238	59	93	223	53	78	205	32	53
10 06 030	485	135	137	420	89	112	424	95	90	305	47	67
10 06 015	504	111	140	413	79	112	424	95	91	358	50	51
10 06 000	523	111	139	378	79	107	446	95	89	365	50	66
10 07 155	2605	396	298	2345	327	226	1950	235	251	1925	270	190
10 07 125	2597	427	313	2414	347	236	2507	328	269	2047	264	191
10 07 100	380	96	140	329	69	119	279	66	79	235	36	67
10 07 075	323	96	138	297	69	98	279	66	79	213	36	59
10 07 050	241	94	124	189	59	89	162	33	85	132	26	52
10 07 030	400	103	130	336	69	109	348	66	97	264	39	66
10 07 015	346	45	105	315	59	89	349	66	75	286	44	65
10 07 000	437	109	134	378	79	130	441	66	71	374	49	69
10 08 130	2789	427	328	2524	324	239	2141	390	246	2367	400	204
10 08 100	2537	399	332	2439	344	272	2188	393	267	2177	278	209
10 08 075	929	174	186	815	132	139	777	166	126	697	102	90
10 08 050	594	122	148	487	91	112	447	100	95	401	56	69
10 08 030	506	116	138	437	81	107	400	67	98	341	51	64
10 08 015	467	103	122	394	71	95	494	67	69	356	62	69
10 08 000	505	109	138	458	81	113	447	67	95	364	46	63
10 09 079	3339	503	376	3192	441	304	2730	399	311	2587	353	234
10 09 040	1603	228	206	1542	215	177	1319	233	240	1272	159	133
10 09 060	701	130	159	615	113	121	612	109	111	545	78	84
10 09 040	514	157	173	442	92	123	424	57	95	371	79	78
10 09 020	563	111	147	420	82	109	400	57	74	307	51	74
10 09 010	474	104	147	413	82	110	471	57	94	364	48	69
10 09 000	484	111	151	406	82	103	447	67	95	348	62	72
10 10 090	3015	499	373	3054	410	274	2777	433	285	2651	332	212
10 10 065	1105	222	212	1085	236	170	965	166	164	969	137	107
10 10 050	889	183	195	935	143	137	900	133	125	712	99	99
10 10 035	1902	274	223	1542	246	191	1459	233	185	1197	171	128
10 10 020	593	117	155	540	92	111	541	190	91	447	59	74

CRUISE W7711A NOV. 1977

SAMPLE ID	400 NANOMETERS B45	B90	F135	450 NANOMETERS B45	B90	B135	500 NANOMETERS B45	B90	B135	550 NANOMETERS B45	B90	B135
	VOLUME SCATTERING FUNCTION (1/M) X 100000											
10 10 010	532	124	139	615	92	107	659	67	95	470	59	69
10 10 000	553	124	120	510	92	98	565	100	89	606	56	59
11 01 040	2365	340	244	1939	277	194	1901	264	185	1729	197	137
11 01 030	1173	215	196	1057	170	135	1029	132	112	830	108	98
11 01 020	1450	222	192	1441	181	151	1330	165	120	971	130	102
11 01 010	1173	215	181	1121	181	140	1045	165	111	908	113	90
11 01 000	1404	255	220	1313	213	183	1235	165	149	1065	136	107
11 02 203	2261	331	252	2239	319	222	2031	257	171	1801	208	133
11 02 190	946	192	179	934	195	140	772	128	120	652	95	88
11 02 150	394	93	130	260	72	110	227	64	70	175	32	58
11 02 100	542	113	137	495	82	99	454	64	59	324	45	58
11 02 075	356	99	132	334	72	92	273	64	77	209	34	58
11 02 030	512	106	143	406	72	110	454	64	91	313	45	64
11 02 010	1188	133	114	957	82	93	409	54	93	329	59	66
11 02 000	522	126	152	421	92	110	409	54	93	425	53	64
11 04 204	4146	617	443	3721	626	314	3472	532	349	3736	461	268
11 04 180	672	150	182	619	110	125	607	89	116	652	77	84
11 04 155	359	99	149	266	74	104	272	89	112	231	38	70
11 04 100	330	98	142	253	64	98	230	59	93	200	31	68
11 04 075	326	98	143	305	64	102	272	59	91	221	38	64
11 04 050	343	104	144	273	55	94	251	30	71	224	38	64
11 04 030	462	98	128	364	64	92	439	59	83	209	41	61
11 04 015	393	86	111	318	74	88	335	89	89	238	38	51
11 04 000	349	92	129	325	74	88	335	89	89	299	41	61
11 05 210	2730	492	365	2840	415	259	2243	697	437	2204	311	221
11 05 175	511	159	209	351	81	111	334	67	79	320	76	114
11 05 150	286	93	145	236	61	96	215	34	85	171	29	79
11 05 100	200	86	140	229	61	96	215	34	95	156	20	65
11 05 075	323	93	143	265	61	101	262	101	130	209	37	62
11 05 050	239	86	140	251	61	102	239	34	84	179	34	62
11 05 030	511	119	157	437	91	107	430	67	98	343	61	72
11 05 015	461	113	150	401	71	109	358	67	101	350	52	72
11 05 000	431	106	154	394	81	116	406	67	99	313	59	74

CRUISE W7711A NOV. 1977

VOLUME SCATTERING FUNCTION (1/M) X 100000

SAMPLE ID	400 NANOMETERS B45	B90	B135	450 NANOMETERS B45	B90	B135	500 NANOMETERS B45	B90	B135	550 NANOMETERS B45	B90	B135
11 06 210	2184	358	290	2299	338	269	2186	346	257	1992	246	193
11 06 175	359	96	122	355	72	91	464	69	75	231	39	47
11 06 150	417	96	156	375	72	133	342	69	105	270	36	80
11 06 100	353	96	132	326	72	100	293	69	83	251	36	56
11 06 075	504	96	111	420	62	90	291	69	79	321	39	47
11 06 050	446	102	127	390	72	89	391	69	79	321	47	54
11 06 030	465	102	159	405	82	117	415	69	101	329	53	91
11 06 015	510	102	142	399	72	111	415	69	101	345	47	71
11 06 000	531	90	123	401	72	96	397	69	78	313	44	59
12 01 210	4055	358	200	2239	338	269	2186	346	257	2088	266	191
12 01 175	601	115	142	615	92	114	538	69	71	454	64	65
12 01 150	514	122	146	489	103	121	449	69	109	333	61	73
12 01 100	456	102	127	360	82	98	342	59	81	247	42	62
12 01 075	330	134	133	297	72	101	269	35	60	231	30	59
12 01 050	339	96	123	309	72	101	293	35	83	211	33	54
12 01 030	334	102	143	362	72	112	415	69	77	337	44	67
12 01 015	475	102	135	435	72	94	391	69	79	321	53	70
12 01 000	407	102	156	330	82	111	342	59	91	301	58	71
12 02 223	2548	397	295	2491	359	231	2583	415	237	2398	273	164
12 02 160	504	115	169	519	82	119	483	69	98	401	54	77
12 02 100	344	96	132	348	72	106	440	69	76	264	35	64
12 02 075	276	83	131	268	62	103	220	59	87	155	36	59
12 02 050	378	90	130	304	72	108	293	59	93	265	40	57
12 02 030	495	102	134	495	82	106	489	69	73	292	45	63
12 02 015	497	102	138	405	62	110	449	69	109	299	48	66
12 02 000	574	109	143	463	82	115	538	62	71	371	48	61
13 01 215	2721	352	278	2427	368	249	2384	311	223	2019	217	160
13 01 175	623	122	141	465	103	114	449	104	107	401	54	67
13 01 150	321	96	124	275	62	88	244	69	86	206	35	56
13 01 100	398	90	134	304	62	101	318	59	82	239	29	56
13 01 075	693	147	164	630	113	128	635	138	115	560	75	74
13 01 050	708	141	155	570	103	124	684	104	99	447	64	74
13 01 030	553	115	158	449	82	139	513	104	121	409	56	84
13 01 015	523	122	159	435	92	138	489	69	122	364	54	79
13 01 000	756	115	134	705	103	102	694	104	98	500	56	56

PHYTOPLANKTON AND NUTRIENT CHEMISTRY DATA

NUTRIENTS

Seawater was sampled in triplicate from the Niskin array attached to the Submersible CTD System. One of these samples was immediately analyzed by the 4-Channel Technicon® Autoanalyzer for nitrate and nitrite, urea, phosphate, and ammonia. Another nutrient sample was frozen for subsequent laboratory silicate analysis. The Technicon® Autoanalyzer was also used in this determination. The third nutrient sample was used as a "spare" sample in the event of accidental loss and/or contamination of the primary nutrient sample.

Samples were generally not filtered or otherwise treated to remove particulate material prior to analysis. Analytical imprecision due to the presence of particulate material is often observed in the phosphate and ammonia analysis. Particulate material is also filtered by the Cadmium column in the nitrate analysis. This gradually obstructs the sample flow through the Cd column thereby interfering with nitrate determination. While Cd-column obstruction was not a problem on W7711A a few samples required filtration for phosphate and ammonia. 10 micron Pecap® screening was formed into a bag and tied to a syringe. Gentle aspriation of the sample attempted to minimize cellular rupture and subsequent leakage of nutrient contents.

The following methodologies and their modifications were used:

1. Phosphate: Callaway et al. (1972)
   a. 830 nm filters used instead of 660 nm
   b. 1 ml levor, a wetting agent, added to hydrazine reagent
   c. Air used to generate reference signal rather than DDW. This also eliminates the need for two additional pump tubes.

d. Heat bath temperature approximately 80°C.

2. Silicate: Calloway et al. (1972) (Postcruise laboratory analysis)

a. 50 mm flow cell instead of 15 mm

b. Tartaric acid when freshly prepared and stored in brown bottle does not require filtration or the addition of chloroform. (Use of glass bottle will gradually increase reagent blank.)

c. Stannous chloride: Not stored under oil with a piece of mossy tin added.

3. Nitrate and Nitrite

a. First bubble is pumped from the system rather than gravity ejected. A 1.0 cc/min pump tube was used for this debubbling process.

b. Sample tube is 0.8 cc/min. Diluter tube is 1.2 cc/min

c. 540 nm filters used.

d. Brig 35 added to sulfanilamid reagent and not to ammonium chloride solution. Brig 35 is found to have bad effects on the cadmium column.

4. Ammonia: Head (1971) with no modification

5. Urea: DeManche et al. (1973) with no modification

Standards, blanks and dilutions were made using single distilled water that was further deionized and filtered by a 4 cartridge milli-Q® water polishing system. Carboys containing this water were prepared at OSU for use at sea. Artificial seawater was made for blank and standard solutions:

118 g reagent grade NaCl

19 g reagent grade $MgSO_4$

0.2 g reagent grade $NaHCO_3$

- made to 4 liters with milli-Q® water.

Working standards were analyzed at the beginning and end of each cast in order to correct for changes in sensitivity and drift. Future work should require that nitrate-nitrite and silicate be adequately temperature regulated in order to minimize temperature related sensitivity fluctuations.

Callaway, J. C., R. D. Tomlinson, L. I. Gordon, L. Barstow, P. K. Park. 1972. An Instruction Manual for Use of the Technicon Autoanalyzer II for Precision Seawater Analysis, August 1972. Oregon State University Technical Report, Revision 1. School of Oceanography, Corvallis, Oregon 97331.

DeManche, J. M. 1973. An Automated Analysis for Urea in Seawater. Limnology and Oceanography. 18(4): 686-689.

Head, P. C. 1971. An Automated Phenolhypochlorite Method for the Determinations of Ammonia in Seawater. Deep-Sea Res. 18: 531-532.

CHLOROPHYLL

Particulate chlorophyll values were obtained by the filtration of one liter of seawater through a 0.45μ membrane filter and freezing the filters for laboratory analysis. The trichlorometric chlorophyll and phaeophytin acidification methods given in Strickland and Parsons (1972) were used with the SCOR-UNESCO (1966) equations. The chlorophyll and phaeophytin a values reported are derived from the acidification method except when this yielded erroneous results, in which case the trichlorometric value for chl a is reported with no phaeo a value.

SCOR-UNESCO. 1966. Report of working group on photosynthetic pigments. Monographs on oceanographic methodology. Publ. UNESCO, Paris.

Strickland, J. D. H. and T. R. Parsons. 1972. A practical handbook of seawater analysis. Fisheries Research Board of Canada. Bull. 167. pp. 310.

CARBON AND NITROGEN

Particulate carbon and nitrogen measurements were made by filtering up to 500 ml of water through an 11 mm diameter glass-fibre filter. The filters are frozen on the ship, oven dried in the laboratory, folded and stuffed into silver capsules, and analyzed by combustion-gas chromatography using a Carlo Erba model 1100 CHN elemental analyzer. The method and description of equipment is given in Pella and Columbo (1973). Overall resolution error estimate is 0.5 μg N/ℓ and 1 μg C/ℓ at the levels found in the NASA samples. The carbon to nitrogen ratio (C/N) provides an index of the "food quality" of the small particulate material. In laboratory phytoplankton cultures, C/N ratios of 5 to 7 indicate nutrient sufficient actively growing cells,

values of 8-11 indicate nutrient limited scenescent cells, and of above 12 indicate dead or dying cells. In field samples from near-shore areas the addition of nonphytoplankton detritus (having a high C/N ratio) tends to mask the phytoplankton "quality" but does represent an integrated value for all of the material available for consumption by filter feeding herbivores.

Pella E. and B. Columbo, 1973. Study of Carbon, Hydrogen and Nitrogen Determination by Combustion - Gas Chromatography. Mikrochim Acta, 1973/5, 697-719.

CRUISE W7711A

DATE 6-Nov-77

TIME 2250

STATION 6-9

LONGITUDE 124° 30.8'W

LATITUDE 45° 20.1'N

WIND DIRECTION 330° SPEED 21 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1025.0

SWELL DIRECTION 280° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 387 M

COMMENTS: 20 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Phaeophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.75	29.68	22.54	56.5	1.94	0.35	----	3.85	0.74				0.36	0.23		
26.9	11.73	32.15	24.45	56.6	2.15	0.37	----	4.25	0.72				0.48	0.19		
51.4	3.79	32.58	25.28	63.0	10.34	0.38	0.25	11.59	1.23				0.39	0.27		
75.9	7.82	32.97	25.73	63.6	19.07	0.28	0.32	22.60	1.60				0.11	0.13		
99.8	8.00	33.53	26.14	63.0	26.33	0.23	0.39	21.40	2.06				0.05	0.06		
147.0	7.99	33.80	26.36	62.8	30.95	0.13	0.37	39.06	2.28				0.03	0.05		
195.9	7.41	33.92	26.53	63.3	33.36	0.11	0.48	42.02	2.42				0.02	0.02		
251.7	6.92	33.98	26.65	61.4	34.49	0.09	0.60	22.03	2.57				0.01	0.84		
300.6	6.42	34.01	26.74	63.1	34.56	0.12	0.49	52.08	2.57				0.00	0.02		

CRUISE W7711A

DATE 7-Nov-77

TIME 0240

STATION 7-1

LONGITUDE 124° 23.5'W

LATITUDE 45° 20.6'N

WIND DIRECTION 310° SPEED 20 kts

CLOUD COVER 2/8 BAROMETRIC PRESSURE 1027.0

SWELL DIRECTION 290° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 312 M

COMMENTS: 15 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.88	32.11	24.40	56.2	2.38	0.01	0.06	4.71	0.60				0.53	0.37		
29.4	11.89	32.14	24.41	56.6	2.43	0.16	0.09	5.09	0.60				0.46	0.40		
53.9	9.23	32.69	25.30	61.2	14.57	0.14	0.13	16.65	1.32				0.12	0.19		
76.6	8.29	33.13	25.79	61.4	21.00	0.03	0.21	23.38	1.71				0.08	0.16		
101.2	8.11	33.53	26.13	63.3	26.32	0.01	0.12	19.12	2.00				0.03	0.07		
143.1	7.95	33.81	26.37	63.0	30.63	0.00	0.22	17.63	2.22				0.02	0.05		
198.6	7.50	33.95	26.55	62.2	33.58	0.05	0.14	45.38	2.42				0.01	0.06		
236.9	6.97	33.93	26.60	55.7	34.81	0.05	0.34	27.84	2.51				0.01	0.08		
301.8	6.18	34.03	26.79	39.1	41.10	0.06	0.21	39.88	2.82				0.01	0.06		

CRUISE W7711A

DATE 7-Nov-77

TIME 0520

STATION 7-2

LONGITUDE 124° 20.0'W

LATITUDE 45° 20.2'N

WIND DIRECTION 345° SPEED 18 kts

CLOUD COVER 6/8 BAROMETRIC PRESSURE 1028.6

SWELL DIRECTION 295° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 217 M

COMMENTS: 13 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.82	32.06	24.37	57.0	2.56	0.11	0.10	5.43	0.75				0.59	0.21		
28.0	11.83	32.09	24.39	57.0	2.48	0.11	----	4.09	0.72				0.63	0.28		
44.8	10.91	32.53	24.89	61.4	6.81	0.24	----	8.61	0.82				0.14	0.21		
69.4	8.62	33.03	25.66	63.1	----	----	----	18.44	----				0.08	0.14		
91.4	8.46	33.36	25.94	63.4	----	----	----	17.59	----				0.05	0.09		
128.7	8.07	33.79	26.34	62.5	----	----	----	24.13	----				0.01	0.08		
180.7	7.95	33.89	26.43	61.88	----	----	----	20.25	----				0.01	0.09		
206.1	7.72	33.94	26.50	59.9	----	----	----	35.04	----				0.01	0.07		

CRUISE W7711A

DATE 7-NOV-77

TIME 0800

STATION 7-3

LONGITUDE 124° 17.0'W

LATITUDE 45° 20.4'N

WIND DIRECTION 345° SPEED 20 kts

CLOUD COVER 7/8 BAROMETRIC PRESSURE 1029.8

SWELL DIRECTION 295° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 179 M

COMMENTS: 11 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 μM	NH_4^+ μM	Urea μM	SiO_4 μM	PO_4 μM	C μg/L	N μg/L	C/N	Chla μg/L	Pheophyton a μg/L	Irradiance % Sfc	Productivity Potential μg C/L Day
1	11.94	32.13	24.40	57.9	1.87	0.29		3.77	0.71				0.30	0.30		
17.3	11.94	32.15	24.42	57.8	1.86	0.48		3.14	0.74				----	----		
26.0	11.94	32.15	24.41	57.8	1.04	0.53		3.58	0.73				0.40	0.21		
48.6	10.66	32.52	24.93	62.1	6.68	0.30	no urea data	8.02	1.08				0.12	0.17		
76.5	8.76	33.36	25.66	63.2	18.45	----		19.62	1.72				0.05	0.10		
105.3	8.62	33.49	26.02	31.8	24.98	----		33.81	2.17				0.02	0.52		
122.5	8.36	33.61	26.15	36.3	28.34	0.14		40.61	2.41				0.04	0.34		
148.5	8.12	33.81	26.34	47.4	29.74	0.15		38.20	----				0.01	0.17		
173.6	7.95	33.85	26.40	36.6	30.92	0.18		43.43	2.42				0.02	0.17		

CRUISE W7711A
DATE 7-NOV-77
TIME 1000
STATION 7-4

LONGITUDE 124° 14.3'W
LATITUDE 45° 20.2'N
WIND DIRECTION 340° SPEED 16 kts
CLOUD COVER 6/8 BAROMETRIC PRESSURE 1030.3

SWELL DIRECTION 300° HEIGHT, ft 12 ft
BOTTOM DEPTH, m 167 M
COMMENTS: 9 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.0	11.78	32.19	24.48	56.1	2.32	0.88	0.47	4.19	0.65				0.18	0.21		
8.6	11.78	32.23	24.50	56.4	2.32	0.96	0.47	4.65	0.60				0.18	0.21		
23.5	11.79	32.25	24.52	56.8	2.29	0.91	0.54	4.87	0.64				0.25	0.26		
45.9	11.36	32.50	24.79	61.0	5.31	0.92	0.59	6.01	1.61				0.16	0.20		
71.7	9.37	33.95	26.26	50.9	16.69	0.95	0.60	22.10	1.60				0.15	0.38		
96.9	8.72	33.50	26.01	29.1	25.70	0.63	0.53	36.11	2.01				0.15	0.65		
122.5	8.54	33.57	26.09	29.9	27.30	0.66	0.61	33.67	2.12				0.10	0.47		
147.2	8.17	33.71	26.26	38.3	29.60	----	0.79	34.09	2.24				0.02	0.21		

CRUISE W7711A

DATE 7-NOV-77

TIME 1230

STATION 7-5B

LONGITUDE 124° 11.5'W

LATITUDE 45° 19.6'N

WIND DIRECTION 350° SPEED 20 kts

CLOUD COVER 6/8 BAROMETRIC PRESSURE 1030.2

SWELL DIRECTION 300° HEIGHT, ft 12 ft

BOTTOM DEPTH, m 147 M

COMMENTS: 7 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.73	32.29	24.56	55.1	3.11	0.80	0.64	5.03	0.74				0.40	0.35		
9.4	11.69	32.34	24.61	55.0	3.11	0.67	0.59	4.56	0.75				0.44	0.34		
26.3	11.60	32.40	24.67	56.3	3.35	0.71	0.54	4.95	0.75				0.59	0.48		
51.9	11.23	32.63	24.91	55.3	5.70	2.47	0.82	6.49	1.01				0.21	0.38		
74.5	9.02	33.30	25.81	46.3	28.02	0.36	0.52	5.09	2.32				0.13	0.61		
100.3	8.70	33.51	26.02	28.3	25.38	0.36	0.51	37.10	2.16				0.08	0.86		
124.5	8.54	33.60	26.11	29.3	26.84	0.32	0.52	34.05	2.28				0.17	0.31		
139.4	8.12	33.90	26.41	30.7	29.53	0.32	0.65	44.18	2.42				0.10	0.12		

CRUISE W7711A

DATE 7-NOV-77

TIME 1445

STATION 7-6

LONGITUDE 124° 08.8'W

LATITUDE 45° 19.8'N

WIND DIRECTION 315° SPEED 22 kts

CLOUD COVER 5/8 BAROMETRIC PRESSURE 1030.2

SWELL DIRECTION 300° HEIGHT, ft 12 ft

BOTTOM DEPTH, m 116 M

COMMENTS: 5 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Trans mission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.58	32.38	24.66	54.7	2.83	0.87	0.54	5.03	0.74				0.61	0.30		
11.7	11.51	32.44	24.72	54.8	2.99	0.91	0.69	4.93	0.75				0.46	0.21		
27.9	11.40	32.52	24.80	56.5	3.87	1.50	0.71	3.98	0.84				0.38	0.26		
49.2	11.22	32.77	25.02	54.7	5.57	2.61	0.90	7.30	1.03				0.23	0.41		
74.1	9.98	33.13	25.52	56.0	16.01	1.28	0.68	18.49	1.59				0.15	0.33		
100.9	8.66	33.47	25.99	36.3	24.55	0.39	0.65	34.39	2.12				0.15	0.60		
106.9	8.50	33.53	26.07	31.4	30.09	0.46	0.65	36.44	2.21				0.17	0.68		

CRUISE W7711A

DATE 7-NOV-77

TIME 1615

STATION 7-7

LONGITUDE 124° 05.5'W

LATITUDE 45° 20.0'N

WIND DIRECTION 315° SPEED 24 kts

CLOUD COVER 5/8 BAROMETRIC PRESSURE 1030.5

SWELL DIRECTION 315° HEIGHT, ft 12 ft

BOTTOM DEPTH, m 93 M

COMMENTS: 3 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
7.3	11.16	32.42	24.77	46.3	4.72	2.84	1.05	6.11	1.00				0.36	0.36		
11.3	11.16	32.42	24.76	44.3	4.76	2.69	0.93	-----	0.98				0.50	0.33		
15.3	11.24	32.56	24.86	51.0	4.34	2.14	0.91	3.73	0.94				0.52	0.37		
21.5	11.31	32.60	24.87	54.2	4.34	2.15	0.83	4.13	0.94				0.38	0.23		
24.0	11.31	32.68	24.94	55.6	4.42	2.35	0.82	4.99	0.95				0.36	0.25		
51.7	11.25	32.73	24.99	46.7	5.00	2.64	0.87	6.63	1.04				0.36	0.52		
75.8	10.98	32.83	25.12	44.3	6.85	2.65	0.89	8.66	1.17				0.31	0.55		
86.7	10.40	33.01	25.35	39.8	11.13	2.66	1.10	13.72	1.43				0.34	0.54		

CRUISE W7711A

DATE 7-NOV-77

TIME 1800

STATION 7-8

LONGITUDE 124° 01.7'W

LATITUDE 45° 20.1'N

WIND DIRECTION 345° SPEED 16 kts

CLOUD COVER 6/8 BAROMETRIC PRESSURE 1031.2

SWELL DIRECTION 310° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 67 M

COMMENTS: 1 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Trans mission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
4.0	11.10	32.17	24.58	45.9	4.91	2.40	1.03	3.21	0.96				0.41	0.18		
13.1	11.15	32.24	24.62	45.7	4.82	2.59	1.00	6.75	0.98				0.41	0.18		
28.0	11.35	32.67	24.92	45.2	4.60	2.62	.97	5.66	1.02				0.37	0.39		
48.0	11.31	32.69	24.95	43.9	4.85	3.10	1.05	3.48	1.03				0.49	0.43		
60.9	11.15	32.76	25.03	41.2	5.39	3.07	1.17	6.82	1.08				0.39	0.52		

CRUISE W7711A

DATE 7-NOV-77

TIME 2000

STATION 7-9

LONGITUDE 124° 15.7'W

LATITUDE 45° 20.2'N

WIND DIRECTION 345° SPEED 20 kts

CLOUD COVER 3/8 BAROMETRIC PRESSURE 1031.8

SWELL DIRECTION 310° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 172 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Trans mission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.87	32.18	24.45	56.1	2.40	0.77	----	4.79	0.66				0.04	0.68		
12.1	11.86	32.22	24.48	56.3	2.40	0.61	----	3.18	0.64				0.04	0.74		
20.6	11.87	32.23	24.47	56.4	2.82	0.54	----	6.18	0.60				0.10	0.65		
32.4	11.87	32.26	24.51	57.1	3.12	0.58	----	3.61	0.64				0.08	0.67		
48.8	10.16	32.80	25.23	62.3	13.74	0.61	----	10.4	1.56				0.01	0.29		
73.1	8.90	33.43	25.93	41.7	20.59	0.27	----	27.6	2.60				0.06	0.72		
97.7	8.68	33.49	26.01	32.4	25.06	0.14	----	26.93	2.14				0.15	0.60		
153	data missing				28.44	----	----	41.07	2.37				0.02	0.21		

CRUISE W7711A

DATE 7-NOV-77

TIME 2200

STATION 7-10

LONGITUDE 124° 15.9'W

LATITUDE 45° 20.1'N

WIND DIRECTION 045° SPEED 12 kts

CLOUD COVER 2/8 BAROMETRIC PRESSURE 1032.0

SWELL DIRECTION 315° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 174 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.81	32.22	24.49	56.5	2.04	0.70	0.56	3.95	0.71				0.46	0.18		
12.4	11.84	32.22	24.48	56.5	2.07	0.68	0.58	2.65	0.65				0.50	0.25		
21.7	11.84	32.23	24.49	56.5	2.02	0.61	0.49	2.76	0.68				0.50	0.20		
31.3	11.84	32.23	24.49	56.4	2.06	0.76	0.53	2.36	0.67				0.50	0.23		
47.7	9.82	32.60	25.14	62.6	8.80	0.50	0.49	12.07	1.10				0.50	0.25		
74.0	8.71	33.19	25.77	60.8	20.93	0.47	0.66	23.57	1.81				0.15	0.21		
104.6	8.33	33.54	26.10	53.9	25.23	0.43	0.58	31.95	2.08				0.06	0.21		
150.9	8.00	33.86	26.40	48.1	30.50	0.34	0.75	41.81	2.39				0.01	0.12		

CRUISE W7711A

DATE 8-NOV-77

TIME 0010

STATION 8-1

LONGITUDE 124° 15.5'W

LATITUDE 45° 20.1'N

WIND DIRECTION 200° SPEED 6 kts

CLOUD COVER 3/8 BAROMETRIC PRESSURE 1031.9

SWELL DIRECTION 315° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 173 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.79	32.24	24.51	56.6	2.25	0.55	0.44	3.59	0.58				0.65	0.26		
14.5	11.80	32.25	24.52	56.6	2.24	0.63	0.48	4.31	0.55				0.65	0.15		
25.0	11.80	32.25	24.52	56.4	2.14	0.53	0.47	4.32	0.58				0.55	0.33		
35.0	11.82	32.29	24.54	56.8	2.26	1.28	0.60	4.61	0.65				0.53	0.13		
50.7	10.47	32.53	24.97	61.5	7.86	0.37	0.62	9.71	1.57				0.15	0.21		
76.9	8.60	33.04	25.67	62.5	18.01	0.37	0.76	19.05	1.58				0.13	0.14		
105.2	8.62	33.52	26.05	29.8	26.41	0.33	0.71	38.39	2.01				0.12	0.53		
151.4	8.03	33.58	26.39	46.6	31.11	0.37	0.81	41.84	2.41				0.04	0.12		

CRUISE W7711A

DATE 8-NOV-77

TIME 0200

STATION 8-2

LONGITUDE 124° 15.5'W

LATITUDE 45° 20.0'N

WIND DIRECTION 90° SPEED 4 kts

CLOUD COVER 3/8 BAROMETRIC PRESSURE 1031.5

SWELL DIRECTION 315° HEIGHT, ft 4 ft

BOTTOM DEPTH, m 163 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.73	32.28	24.56	56.9	2.05	0.56	0.55	4.70	0.71				0.50	0.31		
14.9	11.75	32.30	24.56	57.1	1.99	----	0.59	5.19	0.69				0.55	0.25		
(20)	-----	-----	-----	----	1.98	0.50	0.62	5.74	0.69				0.59	0.26		
34.1	11.78	32.31	24.57	57.5	1.98	0.69	0.61	4.68	0.69				0.52	0.26		
52.9	9.01	32.66	25.31	62.7	10.46	----	0.56	12.76	1.25				0.13	0.22		
76.0	9.02	33.28	25.79	53.5	21.25	0.31	0.68	26.22	1.88				0.06	0.42		
97.8	8.68	33.50	26.02	31.0	25.65	0.33	----	34.07	1.98				0.15	0.60		
151.2	8.03	33.85	26.39	45.3	30.42	----	0.67	42.02	2.43				0.02	0.19		

CRUISE W7711A
DATE 8-NOV-77
TIME 0400
STATION 8-3

LONGITUDE 124° 15.5'W
LATITUDE 45° 20.0'N
WIND DIRECTION 150° SPEED 8 kts
CLOUD COVER 4/8 BAROMETRIC PRESSURE 1031.2

SWELL DIRECTION 315° HEIGHT, ft 4 ft
BOTTOM DEPTH, m 164 M
COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_3 µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Phaeophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.7	11.80	32.22	24.50	57.5	2.11	0.48	no urea data	3.91	0.66				0.48	0.27		
15.5	11.84	32.21	24.48	57.4	2.08	0.47		4.33	0.64				0.46	0.24		
23.5	11.84	32.23	24.50	57.4	2.07	0.48		3.91	0.67				0.48	0.27		
33.9	11.82	32.23	24.50	57.5	2.45	0.55		4.49	0.68				0.44	0.23		
53.1	8.65	32.81	25.48	63.1	13.44	0.39		14.92	1.34				0.12	0.12		
77.7	8.66	33.51	26.02	33.6	25.81	0.32		35.77	2.20				0.12	0.47		
102.4	8.61	33.56	26.07	29.4	26.26	0.33		36.36	2.26				0.08	0.73		
153.8	8.11	33.82	26.35	48.4	29.90	0.33		36.02	2.41				0.02	0.20		

CRUISE W7711A

DATE 8-NOV-77

TIME 0615

STATION 8-4

LONGITUDE 124° 15.5'W

LATITUDE 45° 20.1'N

WIND DIRECTION 150° SPEED 9 kts

CLOUD COVER 3/8 BAROMETRIC PRESSURE 1030.8

SWELL DIRECTION 310° HEIGHT, ft 6 ft

BOTTOM DEPTH, m 169 M

COMMENTS: Anchor at 10 NM offshore

Depth m	Temp. °C	Salin-ity °/..	Sigma t	Trans mission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophy-ton a µg/L	Irra-diance % Sfc	Productivity Potential µg C/L Day
1	11.78	32.19	24.47	57.3	1.98	----		3.37	0.68				0.44	0.10		
12.4	11.82	32.18	24.46	57.4	1.91	----	no	3.53	0.64				0.48	0.35		
20.8	11.82	32.19	24.47	57.3	1.96	----	urea	2.42	0.63				0.43	0.15		
30.8	11.83	32.31	24.57	59.4	2.72	----		2.81	0.73				0.27	0.27		
52.9	8.87	32.93	25.54	62.8	14.49	----	data	14.41	1.41				0.11	0.11		
75.0	8.83	33.44	25.94	38.9	24.66	----		20.05	2.09				0.10	0.49		
99.5	8.44	33.52	26.07	41.5	25.77	----		19.83	2.13				0.05	0.42		
145.9	8.15	33.80	26.33	49.0	30.06	----		38.89	2.37				0.03	0.13		

CRUISE W7711A

DATE 8-NOV-77

TIME 0810

STATION 8-5

LONGITUDE 124° 15.7'W

LATITUDE 45° 19.7'N

WIND DIRECTION 140° SPEED 7 kts

CLOUD COVER 2/8 BAROMETRIC PRESSURE 1030.0

SWELL DIRECTION 315° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 173 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.9	11.79	32.18	24.47	56.3	1.80	0.57		5.15	0.64				0.48	0.06		
12.1	11.80	32.20	24.48	56.8	1.72	0.47	no	3.05	0.57				0.50	0.25		
21.8	11.80	32.16	24.45	56.9	1.87	0.92	ur	4.78	0.66				0.57	0.07		
31.2	11.80	32.19	24.47	57.3	1.69	0.72	ea	4.34	0.64				0.59	0.00		
51.7	9.24	32.75	25.34	62.5	11.79	0.85	da	13.56	1.30				0.13	0.10		
76.0	8.88	33.21	25.76	42.3	22.89	0.51	ta	31.21	2.06				0.12	0.38		
99.8	8.39	33.52	26.08	54.9	23.33	0.48		30.23	2.09				0.08	0.25		
150.6	8.05	33.85	26.38	48.8	29.85	0.38		21.11	2.52				0.04	0.08		

CRUISE W7711A | LONGITUDE 124° 15.8'W | SWELL DIRECTION 315° HEIGHT, ft 10 ft

DATE 8-NOV-77 | LATITUDE 45° 20.2'N | BOTTOM DEPTH, m 172 M

TIME 1010 | WIND DIRECTION 160° SPEED 4 kts | COMMENTS: Anchor station at 10 NM offshore

STATION 8-6 | CLOUD COVER 3/8 BAROMETRIC PRESSURE 1029.7

Depth m	Temp. °C	Salinity ‰	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.3	11.80	32.15	24.44	55.5	2.18	0.48		5.24	0.70				0.48	0.38		
13.1	11.78	32.18	24.47	55.6	2.07	0.62	no	5.43	0.69				0.61	0.54		
22.9	11.79	32.19	24.47	56.0	2.04	0.74	ur	5.20	0.69				0.59	0.42		
33.0	11.86	32.28	24.53	58.9	2.28	0.73	ea	5.11	0.71				0.33	0.32		
49.3	9.74	32.87	25.36	62.3	11.16	0.26	da	13.56	1.24				0.10	0.20		
78.9	8.85	33.42	25.93	41.3	23.46	0.48	ta	25.80	2.04				0.04	0.71		
104.6	8.36	33.61	26.15	51.9	26.51	0.48		25.88	2.17				0.02	0.22		
150.3	7.99	33.85	26.40	48.9	30.34	0.41		41.78	2.42				0.00	0.15		

CRUISE W7711A

DATE 8-NOV-77

TIME 1300

STATION 8-73

LONGITUDE 124° 16.0'W

LATITUDE 45° 20.8'N

WIND DIRECTION 160° SPEED 4 kts

CLOUD COVER 4/8 BAROMETRIC PRESSURE 1027.2

SWELL DIRECTION 315° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 168 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity ‰	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.85	32.20	24.47	55.1	2.02	0.50	1.81	4.31	0.70				0.55	0.36		
11.8	11.81	32.20	24.48	54.6	2.10	0.44	2.02	2.75	0.69				0.57	0.34		
22.9	11.82	32.19	24.47	55.3	2.08	0.89	1.66	2.70	0.69				0.61	0.35		
31.6	11.78	32.22	24.50	56.2	2.06	0.60	1.77	3.07	0.65				0.65	0.39		
52.6	9.88	32.77	25.25	62.1	10.16	0.59	.77	11.17	1.20				0.13	0.18		
73.0	8.72	33.07	25.68	63.2	18.06	0.28	.61	18.79	1.64				0.08	0.13		
99.1	8.65	33.51	26.03	31.8	25.96	0.30	.53	36.28	2.19				0.10	0.71		
151.8	8.06	33.84	26.38	50.3	30.66	0.34	.67	42.11	2.43				0.02	0.12		

CRUISE W7711A

DATE 8-NOV-77

TIME 1400

STATION 8-8

LONGITUDE 124° 15.4'W

LATITUDE 45° 19.9'N

WIND DIRECTION 150° SPEED 2 kts

CLOUD COVER 5/8 BAROMETRIC PRESSURE 1026.2

SWELL DIRECTION 315° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 164 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.4	11.92	32.20	24.46	55.3	1.93	0.38	0.56	4.79	0.71				0.34	0.38		
14.6	11.80	32.21	24.48	54.4	1.98	0.45	0.65	5.86	0.71				0.42	0.62		
23.7	11.78	32.23	24.51	54.7	1.94	0.46	0.56	4.93	0.70				0.50	0.39		
33.9	11.82	32.27	24.53	57.6	1.99	0.57	0.92	4.93	0.75				0.44	0.12		
52.7	9.06	32.78	25.40	62.7	12.16	0.24	0.54	14.92	1.35				0.13	0.23		
78.0	9.12	33.36	25.84	45.2	22.23	0.47	0.56	29.91	2.00				0.14	0.42		
102.7	8.63	33.54	26.05	31.2	26.18	0.34	0.57	37.03	2.19				0.14	0.53		
150.8	8.01	33.86	26.40	42.5	30.62	0.34	0.61	42.73	2.51				0.35	0.15		

CRUISE W7711A
DATE 8-NOV-77
TIME 1600
STATION 8-9

LONGITUDE 124° 15.5'W
LATITUDE 45° 20.1'N
WIND DIRECTION 150° SPEED 5 kts
CLOUD COVER 8/8 BAROMETRIC PRESSURE 1025.0

SWELL DIRECTION 300° HEIGHT, ft 6 ft
BOTTOM DEPTH, m 154 M
COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 μM	NH_4^+ μM	Urea μM	SiO_4 μM	PO_4 μM	C μg/L	N μg/L	C/N	Chla μg/L	Pheophyton a μg/L	Irradiance % Sfc	Productivity Potential μg C/L Day
1	11.84	32.14	24.42	54.1	1.99	0.46	1.49	3.64	0.73				0.61	0.16		
15.4	11.80	32.15	24.44	54.3	1.93	0.42	0.77	4.48	0.71				0.67	0.32		
24.6	11.80	32.14	24.43	54.9	2.07	0.49	0.51	4.39	0.73				0.63	0.33		
34.1	11.78	32.23	24.51	57.3	2.30	0.52	0.41	4.45	0.75				0.42	0.30		
54.1	8.48	32.81	25.51	63.1	13.15	0.34	0.38	15.52	1.43				0.11	0.16		
77.0	8.93	33.35	25.86	50.3	23.12	0.39	0.47	26.76	1.96				0.08	0.54		
102.8	8.36	33.56	26.11	52.2	26.10	0.53	0.48	31.51	2.13				0.04	0.26		
151.3	8.02	33.84	26.38	43.8	31.00	0.25	0.59	42.71	2.45				0.02	0.15		

CRUISE W7711A

DATE 8-NOV-77

TIME 1808

STATION 8-10

LONGITUDE 124° 16.1'W

LATITUDE 45° 20.2'N

WIND DIRECTION 190° SPEED 8 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1024.1

SWELL DIRECTION 290° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 173 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.9	11.74	32.12	24.42	52.5	2.55	0.31	1.49	5.51	0.72				0.13	0.94		
13.2	11.74	32.13	24.43	52.4	2.46	0.02	1.37	5.44	0.71				0.15	0.92		
23.8	11.75	32.15	24.45	54.7	----	----	----	----	----				----	----		
26.1	11.78	32.17	24.45	55.7	2.24	0.37	.44	2.53	0.70				0.08	0.89		
50.7	8.48	32.73	25.45	63.1	11.20	0.30	.51	6.06	1.25				0.03	0.23		
77.1	8.68	33.33	25.89	51.4	23.17	0.22	.60	28.98	1.96				0.04	0.49		
101.3	8.33	33.57	26.13	55.7	25.91	0.22	.59	14.69	2.11				0.03	0.17		
148.9	8.13	33.83	26.33	51.4	29.55	0.23	.76	40.04	2.34				0.04	0.13		

CRUISE W7711A

DATE 8-NOV-77

TIME 2005

STATION 8-11

LONGITUDE 124° 15.6'W

LATITUDE 45° 20.2'N

WIND DIRECTION 190° SPEED 10 kts

CLOUD COVER 7/8 BAROMETRIC PRESSURE 1023.0

SWELL DIRECTION 295° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 170 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.7	11.68	32.10	24.43	51.8	2.74	0.11	0.40	6.63	0.71				0.65	0.63		
12.2	11.69	32.13	24.44	52.6	2.65	0.08	0.45	5.86	0.71				0.74	0.67		
24.2	11.73	32.15	24.45	53.8	2.55	0.15	0.59	6.24	0.71				0.67	0.61		
(30)	m i s	s i n g	d a t	a	2.41	0.31	0.70	2.88	0.70				0.48	0.46		
52.2	8.25	32.80	25.54	63.2	14.05	0.08	0.60	10.9	1.42				0.08	0.15		
76.7	8.63	33.38	25.93	51.4	23.28	0.18	0.65	19.27	2.01				0.05	0.36		
100.3	8.29	33.58	26.14	62.5	25.81	0.16	0.66	20.32	2.15				0.02	0.09		
149.3	8.07	33.85	26.39	46.6	30.12	0.21	0.70	29.31	2.47				0.02	0.17		

AD-A092 988 OREGON STATE UNIV CORVALLIS SCHOOL OF OCEANOGRAPHY F/G 8/10
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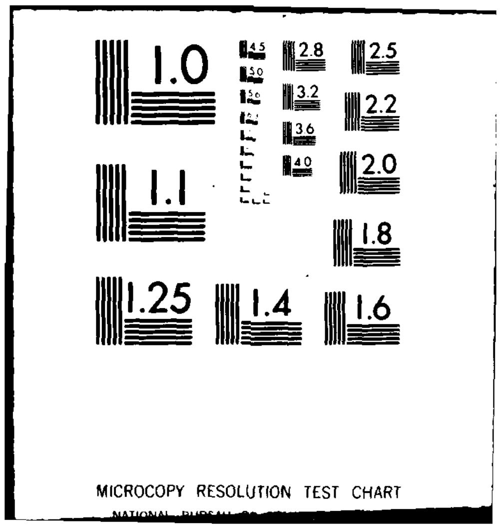
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CRUISE W7711A

DATE 8-NOV-77

TIME 2202

STATION 8-12

LONGITUDE 124° 15.8'W

LATITUDE 45° 20.5'N

WIND DIRECTION 180° SPEED 14 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1022.1

SWELL DIRECTION 295° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 171 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.70	32.13	24.44	54.2	2.59	0.26	1.62	4.69	0.70				1.30	0.73		
14.6	11.71	32.10	24.41	54.6	2.69	0.31	0.42	4.80	0.69				1.64	0.71		
23.1	11.71	32.13	24.44	54.3	2.60	0.19	0.44	4.11	0.69				1.45	0.79		
32.3	11.71	32.13	24.44	55.1	2.68	0.11	0.40	4.41	0.69				1.18	0.95		
52.0	8.93	32.69	25.35	63.0	10.87	0.00	0.45	12.59	1.20				0.22	0.37		
74.9	8.28	32.97	25.67	63.3	16.82	0.13	0.47	13.52	1.48				0.12	0.28		
104.5	8.31	33.56	26.12	62.4	25.72	0.16	0.60	19.72	2.06				0.03	0.21		
147.2	8.04	33.86	26.39	41.2	30.11	0.18	0.70	42.78	2.39				0.02	0.36		

CRUISE W7711A

DATE 9-NOV-77

TIME 0010

STATION 9-1

LONGITUDE 124° 15.5'W

LATITUDE 45° 19.8'N

WIND DIRECTION 180° SPEED 20 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1022.0

SWELL DIRECTION 300° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 165 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.7	11.66	32.12	24.44	54.3	2.59	0.05	0.30	3.80	0.66				0.69	0.65		
14.9	11.68	32.12	24.44	54.8	2.69	0.07	0.43	2.89	0.68				0.88	0.46		
24.6	11.71	32.14	24.45	54.8	2.53	0.17	0.58	5.74	0.68				0.80	0.48		
33.5	11.73	32.19	24.48	56.0	2.45	0.27	0.60	2.67	0.64				0.63	0.20		
54.3	9.37	32.65	25.24	62.7	10.41	0.09	0.51	10.28	1.15				0.16	0.15		
77.9	8.60	33.13	25.74	62.2	18.98	0.09	0.51	17.09	1.63				0.08	0.08		
102.1	8.48	33.56	26.10	37.1	25.91	0.14	0.50	30.34	2.94				0.07	0.36		
150.9	8.03	33.85	26.39	42.1	30.51	0.14	0.61	29.00	2.37				0.02	0.33		

CRUISE W7711A

DATE 9-NOV-77

TIME 0200

STATION 9-2

LONGITUDE 124° 15.5'W

LATITUDE 45° 20.3'N

WIND DIRECTION 185° SPEED 24 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1021.5

SWELL DIRECTION 300° HEIGHT, ft 6 ft

BOTTOM DEPTH, m 165 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/°°	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.8	11.66	32.11	24.43	53.0	2.33	0.01	0.53	5.60	0.72				0.78	0.50		
10.0	11.67	32.11	24.43	54.4	2.32	0.00	0.55	5.75	0.74				0.80	0.53		
19.6	11.66	32.14	24.46	54.3	2.35	0.03	0.47	5.22	0.75				0.88	0.25		
27.7	11.68	32.11	24.43	54.5	2.82	0.05	0.50	5.18	0.76				0.71	0.44		
49.5	9.05	32.71	25.34	62.8	6.12	0.08	0.56	8.22	1.01				0.42	0.28		
76.9	8.38	33.25	25.87	63.1	20.53	0.04	0.62	10.89	1.80				0.07	0.12		
100.5	8.29	33.50	26.08	58.19	24.57	0.13	0.78	17.38	2.06				0.03	0.12		
151.1	8.06	33.84	26.37	49.2	27.90	0.12	0.85	32.31	2.25				0.02	0.13		

CRUISE W7711A
DATE 9-NOV-77
TIME 0400
STATION 9-3

LONGITUDE 124° 15.6'W
LATITUDE 45° 19.9'N
WIND DIRECTION 185° SPEED 24 kts
CLOUD COVER 8/8 BAROMETRIC PRESSURE 1021.0

SWELL DIRECTION 300° HEIGHT, ft 5 ft
BOTTOM DEPTH, m 164 M
COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity ‰	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Phaeophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.66	32.11	24.43	53.8	2.73	1.22	0.62	5.52	0.71				0.82	0.62		
11.2	11.67	32.13	24.45	55.1	2.71	1.04	0.64	5.49	0.67				0.50	0.41		
21.1	11.68	32.11	24.43	55.0	2.72	0.84	0.54	5.44	0.68				0.53	0.40		
30.8	11.66	32.10	24.43	55.0	2.72	0.76	0.54	5.40	0.68				0.69	0.60		
46.7	9.38	32.66	25.25	62.6	7.31	0.57	0.63	7.98	1.00				0.17	0.31		
72.9	8.40	33.21	25.83	63.1	19.85	0.36	0.65	19.18	1.73				0.05	0.10		
99.2	8.29	33.49	26.07	61.4	23.51	0.21	0.54	28.40	1.99				0.04	0.11		
147.2	8.09	33.82	26.36	47.8	29.34	0.08	0.62	40.91	2.39				0.02	0.14		

CRUISE W7711A

DATE 9-NOV-77

TIME 0621

STATION 9-4

LONGITUDE 124° 15.5'W

LATITUDE 45° 19.5'N

WIND DIRECTION 185° SPEED 26 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1019.5

SWELL DIRECTION 300° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 165 M

COMMENTS: Anchor station at 10 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
4.9	11.64	32.11	24.44	55.1	2.68	0.12	1.45	5.18	0.74				0.78	0.29		
12.2	11.65	32.12	24.45	53.9	2.65	0.18	0.55	6.26	0.76				0.94	0.05		
21.2	11.64	32.01	24.36	54.8	2.59	0.12	0.44	6.22	0.75				0.94	0.19		
31.4	11.58	32.27	24.57	58.8	3.62	0.42	0.49	4.11	0.81				0.44	0.10		
46.3	8.79	32.84	25.49	62.9	9.59	0.00	0.45	11.66	1.45				0.15	0.10		
74.3	8.32	33.27	25.89	63.3	21.41	0.06	0.78	14.39	1.77				0.08	0.03		
99.8	8.29	33.56	26.12	62.5	25.52	0.10	0.40	25.75	2.04				0.03	0.05		
148.8	8.06	33.85	26.38	45.1	30.38	0.16	0.56	25.85	2.39				0.04	0.14		

CRUISE W7711A

DATE 9-NOV-77

TIME 0900

STATION 9-5

LONGITUDE 124° 01.7'W

LATITUDE 45° 19.9'N

WIND DIRECTION 185° SPEED 22 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1020.7

SWELL DIRECTION 300° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 51 M

COMMENTS: 1 NM offshore - no CTD record

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Trans mission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1					3.94	1.50	0.95	6.65	0.81				0.36	0.20		
10	d a t a	m i	s s i n	g	4.00	1.51	0.94	4.61	0.61				0.20	0.30		
20					3.97	1.53	2.96	3.98	0.85				0.33	0.21		
30					21.09	0.17	1.00	3.85	1.81				0.23	0.39		
40					6.11	2.44	1.12	7.75	1.10				0.10	0.44		
48					8.08	2.15	0.00	9.16	1.19				0.19	0.[illegible]6		

CRUISE W7711A
DATE 9-NOV-77
TIME 1100
STATION 9-6

LONGITUDE 124° 05.3'W
LATITUDE 45° 20.3'N
WIND DIRECTION 170° SPEED 20 kts
CLOUD COVER 7/8 BAROMETRIC PRESSURE 1019.4

SWELL DIRECTION 300° HEIGHT, ft 8 ft
BOTTOM DEPTH, m 87 M
COMMENTS: 3 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.25	32. 1	24.74	55.3	4.13	1.50	1.20	4.15	0.86				0.24	0.29		
17.4	11.21	32.39	24.74	55.0	4.18	1.87	0.81	3.00	0.87				0.33	0.29		
29.9	11.23	32. 8	24.72	55.9	4.18	1.81	0.79	2.78	0.36				0.17	0.29		
38.6	11.21	32.40	24.74	54.9	4.18	1.81	0.75	2.91	0.82				0.25	0.31		
48.9	11.31	32.73	24.98	59.24	5.03	1.99	0.79	5.53	0.89				0.10	0.24		
57.7	11.24	32.74	25.00	58.8	5.57	2.23	0.88	2.68	1.11				0.09	0.32		
63.8	11.03	32.78	25.06	52.5	7.85	2.21	0.55	4.69	2.11				0.06	0.56		
82.0	8.56	33.55	26.07	34.0	26.03	----	1.23	36.07	0.94				0.06	0.64		

CRUISE W7711A

DATE 9-NOV-77

TIME 1230

STATION 9-7

LONGITUDE 124° 07.2'W

LATITUDE 45° 20.0'N

WIND DIRECTION 170° SPEED 20 kts

CLOUD COVER 7/8 BAROMETRIC PRESSURE 1019.4

SWELL DIRECTION 300° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 95 M

COMMENTS: 5 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.2	11.13	32.39	24.75	52.3	4.41	1.88	1.22	6.33	0.99				0.61	0.08		
16.9	11.13	32.40	24.75	51.7	4.41	1.90	0.89	6.11	1.00				0.59	0.18		
28.7	11.13	32.39	24.74	52.5	4.42	2.02	0.97	6.36	1.01				0.59	0.16		
37.8	11.34	32.68	24.93	57.9	4.59	1.84	0.83	5.80	1.06				0.14	0.22		
49.1	11.20	32.76	25.02	57.0	5.72	2.33	0.96	7.35	1.22	6.91	0.46	14.93	0.13	0.43		
60.0	10.57	32.95	25.28	51.2	10.88	2.12	0.91	14.49	1.54				0.20	0.59		
76.3	9.12	33.29	25.78	51.9	19.63	0.41	0.71	24.60	1.96				0.11	0.49		
90.9	8.37	33.64	26.17	33.3	27.06	0.07	0.79	38.97	2.48				0.06	0.53		

CRUISE W7711A

DATE 9-NOV-77

TIME 1415

STATION 9-8

LONGITUDE 124° 10.5'W

LATITUDE 45° 20.0'N

WIND DIRECTION 180° SPEED 20 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1019.0

SWELL DIRECTION 300° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 122

COMMENTS: 7 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Trans mission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.3	11.63	32.10	24.43	51.4	2.69	0.02	0.61	6.03	0.68	12.15	0.98	12.46	0.76	0.36		
17.7	11.62	32.11	24.49	51.7	2.72	0.00	0.76	5.70	0.68	15.07	1.41	10.4	0.80	0.48		
31.0	11.36	32.37	24.69	54.9	3.96	1.03	0.87	5.73	0.86	12.84	1.23	10.47	0.44	0.28		
49.2	11.30	32.69	24.95	55.7			f	a i l e d	t o	c l o	s e					
72.8	10.36	32.89	25.27	57.3	11.13	1.24	0.82	19.49	1.26	8.06	0.46	17.68	0.10	0.34		
98.0	8.82	33.42	25.93	40.8	24.37	0.14	----	32.94	2.03	-----	----	-----	0.10	0.63		
114.2	8.28	33.70	26.24	35.8	29.14	0.15	0.29	41.78	2.36	23.88	1.75	13.66	0.05	0.45		

CRUISE W7711A

DATE 9-NOV-77

TIME 1600

STATION 9-9

LONGITUDE 124° 14.0'W

LATITUDE 45° 20.0'N

WIND DIRECTION 180° SPEED 20 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1018.8

SWELL DIRECTION 270° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 156 M

COMMENTS: 9 NM offshore

Depth m	Temp. °C	Salinity °/°°	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Phoophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.67	3 .19	24.49	55.0	2.96		0.87	5.25	0.67	13.75	1.04	13.26	0.59	0.29		
13.7	11.67	32.22	24.52	55.0	2.78		1.83	54.88	0.62	14.44	1.28	11.28	0.61	0.51		
31.5	11.66	32.22	24.52	55.	2.		0.56	5.25	0.67	13.84	0.99	13.93	0.52	0.37		
47.8	9.95	32.64	25.14	62.3	4.92		0.54	6.48	0.81							
70.1	8.62	33.01	25.64	63.3	16.77		0.52	17.85	1.49	11.29	0.73	15.51	0.06	0.08		
105.5	8.51	33.59	26.11	36.4	27.24		0.51	37.96	2.23	15.15	1.44	10.50	0.21	0.16		
140.6	8.19	33.78	26.31	52.4	29.59		0.50	32.11	2.32	11.68	0.73	15.96	0.04	0.04		
147.2	8.05	33.82	26.36	33.6	30.02		0.79	33.01	2.41	14.21	0.91	15.68	0.06	0.05		

CRUISE W7711A

DATE 9-NOV-77

TIME 1815

STATION 9-10

LONGITUDE 124° 17.6'W

LATITUDE 45° 19.8'N

WIND DIRECTION 180° SPEED 30 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1017.8

SWELL DIRECTION 270° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 176 M

COMMENTS: 11 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 μM	NH_4^+ μM	Urea μM	SiO_4 μM	PO_4 μM	C μg/L	N μg/L	C/N	Chl a μg/L	Pheophyton a μg/L	Irradiance % Sfc	Productivity Potential μg C/L Day
1	11.63	32.17	24.48	55.4	2.35	0.28	0.54	2.40	0.66	12.69	1.19	10.70	0.36	0.31		
10.5	11.63	32.20	24.51	56.0	2.28	----	0.49	3.94	0.68	14.72	1.21	12.16	0.38	0.26		
22.5	11.63	32.17	24.49	55.9	2.08	----	0.44	3.51	0.68	12.03	1.05	11.45	0.48	0.30		
33.4	11.63	32.21	24.52	56.0	2.06	0.17	0.48	4.21	0.67	24.71	1.52	16.30	0.44	0.26		
53.2	9.03	32.83	25.44	62.6	15.09	0.04	0.56	13.71	1.42	12.78	0.71	18.00	0.04	0.18		
72.6	8.31	33.18	25.82	63.1	20.38	0.00	0.48	13.22	1.71	9.72	0.56	17.43	0.04	0.18		
92.5	8.30	33.57	26.13	62.5	26.03	0.30	0.51	28.96	2.01				0.01	0.08		
126.5	8.21	33.78	26.30	52.96	28.95	0.01	0.47	22.83	2.31	7.14	0.32	22.47	0.02	0.12		
167.1	7.68	33.94	26.51	36.0	31.52	0.22	0.61	24.97	2.49	14.87	0.88	16.95	0.02	0.18		

CRUISE W7711A

DATE 10-NOV-77

TIME 0830

STATION 10-1

LONGITUDE 124° 19.8'W

LATITUDE 45° 20.2'N

WIND DIRECTION 180° SPEED 16 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1019.5

SWELL DIRECTION 270° HEIGHT, ft 12 ft

BOTTOM DEPTH, m 197 M

COMMENTS: 13 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.0	11.62	32.21	24.52	54.4	1.98	0.04		3.72	0.65	17.58	1.15	15.25	0.84	0.26		
11.8	11.62	32.18	24.49	54.5	1.97	0.13		4.21	0.64	11.40	1.12	10.21	0.83	0.12		
21.2	11.62	32.19	24.50	54.3	1.96	0.09	no	2.81	0.64	12.46	0.99	12.59	0.81	0.31		
33.3	11.62	32.19	24.50	54.7	1.99	0.12		4.64	0.63	13.01	1.39	9.36	0.91	0.12		
54.2	9.25	32.58	25.21	61.5	11.55	0.02	ure	9.16	1.21	6.85	0.38	18.06	0.13	0.13		
103.1	8.17	33.57	26.15	63.2	25.95	0.03	a	28.27	2.02	3.95	----	-----	0.04	0.08		
122.3	8.10	33.65	26.22	63.1	28.03	0.48		17.61	2.18	5.85	0.30	19.30	0.02	0.07		
147.6	8.03	33.80	26.35	60.7	29.77	0.16		28.34	2.27	5.11	0.20	26.30	0.01	0.08		
191.3	7.44	34.06	26.64	37.1	32.22	0.16		48.91	2.50	14.04	0.94	15.01	0.02	0.14		

CRUISE W7711A

DATE 10-NOV-77

TIME 1020

STATION 10-2

LONGITUDE 124° 23.0'W

LATITUDE 45° 20.4'N

WIND DIRECTION 165° SPEED 16 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1018.6

SWELL DIRECTION 270° HEIGHT, ft 12 ft

BOTTOM DEPTH, m 263 M

COMMENTS: 15 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.2	11.73	32.13	24.44	54.1	2.27	0.07	ND	3.92	0.66	11.15	1.02	10.98	1.41	0.81		
17.1	11.72	32.14	24.44	54.2	2.31	0.09	.01	4.57	0.66	7.77	0.52	14.91	1.30	0.89		
31.0	11.73	32.14	24.44	54.7	2.27	0.09	ND	4.66	0.65	18.53	1.25	14.85	1.39	0.98		
52.6	9.98	32.46	25.00	61.5	8.77	0.10	.53	9.44	1.07	7.63	0.53	14.43	0.48	0.25		
76.3	8.53	33.14	25.76	63.3	18.72	0.03	.17	20.85	1.72	5.57	0.20	28.65	0.10	0.25		
100.2	7.97	33.55	26.17	62.5	25.34	0.05	.24	25.96	2.11	6.45	0.27	23.85	0.07	0.23		
150.1	7.90	33.84	26.40	61.4	30.52	0.24	.33	27.50	2.37	7.86	0.33	24.17	0.02	0.13		
196.6	7.56	33.94	26.53	59.4	31.57	0.09	.51	40.74	2.47	9.57	0.38	25.23	0.02	0.13		
251.8	6.98	33.96	26.63	60.6	33.03	0.13	.74	49.65	2.53	5.57	0.22	25.76	0.02	0.12		

CRUISE W7711A

DATE 10-NOV-77

TIME 1215

STATION 10-3

LONGITUDE 124° 30.0'W

LATITUDE 45° 20.4'N

WIND DIRECTION 170° SPEED 14 kts

CLOUD COVER 7/8 BAROMETRIC PRESSURE 1018.0

SWELL DIRECTION 270° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 388 M

COMMENTS: 20 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.3	11.73	32.11	24.42	53.1	2.47	0.06	0.67	5.22	0.71	10.72	0.91	11.73	0.84	0.39		
13.1	11.73	32.13	24.44	52.9	2.46	0.11	0.59	5.12	0.71	14.92	0.93	16.08	1.03	0.36		
30.3	11.71	32.14	24.45	53.3	2.07	0.08	0.55	4.54	0.69	16.07	1.66	9.67	0.92	0.47		
50.2	9.65	32.49	25.07	61.4	8.31	0.14	0.56	9.06	1.06	9.86	0.75	13.08	0.15	0.33		
77.1	8.09	33.20	25.87	61.8	20.36	0.03	1.02	24.35	1.79	8.06	4.18	1.93	0.08	0.12		
99.4	7.89	33.44	26.09	62.8	24.61	0.04	0.85	30.37	1.98	6.34	0.24	26.65	0.06	0.08		
141.4	7.99	33.82	26.37	62.9	30.32	0.04	0.44	39.42	2.31	7.57	0.45	16.88	0.02	0.06		
186.7	7.64	33.97	26.54	62.9	31.61	0.27	0.61	42.08	2.38	8.71	0.43	20.42	0.01	0.06		
228.9	7.22	33.98	26.61	63.3	32.71	0.05	0.52	48.74	2.47	1.80	0.20	9.28	0.01	0.03		
296.8	6.53	34.03	26.74	63.5	35.11	0.05	0.68	57.34	2.59	5.82	0.26	22.43	0.00	0.06		

CRUISE	W7711A	LONGITUDE	124° 23.6'W	SWELL DIRECTION	265°	HEIGHT, ft	10 ft
DATE	10-NOV-77	LATITUDE	45° 20.4'N	BOTTOM DEPTH, m	296 M		
TIME	1400	WIND DIRECTION	165°	SPEED	10 kts		
STATION	10-4	CLOUD COVER	6/8	BAROMETRIC PRESSURE	1016.8		

COMMENTS: 15 NM offshore

Depth m	Temp. °C	Salinity °/°°	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Phoophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.2	11.75	32.16	24.46	52.6	0.44	0.06	0.41	5.39	0.68	23.74	2.29	10.35	0.57	0.34		
12.7	11.74	32.15	24.45	52.7	0.45	0.06	0.42	5.45	0.68	21.13	2.26	9.35	0.71	0.36		
29.4	11.69	32.14	24.45	54.8	0.50	0.09	0.46	6.22	0.69	15.32	1.73	8.88	0.82	0.38		
48.7	9.65	32.53	25.11	61.8	10.17	0.00	0.46	13.04	1.17	12.72	1.02	12.53	0.13	0.23		
76.5	8.26	32.97	25.67	62.0	18.55	0.01	0.55	19.53	1.66	6.64	0.40	16.70	0.08	0.19		
98.3	7.97	33.46	26.09	61.8	25.91	0.02	0.47	29.51	2.09	8.37	0.45	18.67	0.05	0.13		
143.4	8.05	33.82	26.36	62.9	30.82	0.02	0.45	34.51	2.36	14.75	1.41	10.46	0.02	0.10		
191.2	7.72	33.94	26.50	62.5	32.36	0.11	0.47	35.96	2.48	12.81	0.38	34.07	0.01	0.10		
238.4	7.36	33.97	26.58	60.2	33.27	0.05	0.82	48.58	2.56	8.53	0.36	23.80	0.05	0.06		
291.0	7.04	33.98	26.63	60.1	33.62	0.04	0.71	50.96	2.52	7.17	0.45	16.12	0.02	0.04		

CRUISE W7711A

DATE 10-NOV-77

TIME 1600

STATION 10-5

LONGITUDE 124° 19.0'W

LATITUDE 45° 20.0'N

WIND DIRECTION 160° SPEED 6 kts

CLOUD COVER 6/8 BAROMETRIC PRESSURE 1015.7

SWELL DIRECTION 265° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 184 M

COMMENTS: 13 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.62	32.16	24.48	52.7	1.88	0.00	0.54	4.35	0.67	12.21	0.97	12.56	0.80	0.37		
14.0	11.63	32.19	24.50	52.3	1.88	0.05	0.54	4.02	0.66	15.01	0.89	16.97	0.90	0.44		
34.9	11.60	32.20	24.51	55.2	1.93	0.17	0.79	3.81	0.65	16.67	1.34	12.42	0.84	0.47		
51.7	9.45	32.58	25.18	62.0	11.05	0.03	0.41	11.68	1.21	11.95	0.75	15.86	0.13	0.22		
74.8	8.15	33.16	25.83	61.3	20.45	0.00	0.47	22.37	1.77	13.15	0.93	14.23	0.08	0.16		
99.9	8.29	33.53	26.10	63.1	24.59	0.09	0.42	29.61	2.01	9.00	0.46	19.44	0.02	0.11		
150.7	8.16	33.79	26.33	56.7	29.06	0.05	0.66	38.00	2.29	6.03	0.59	10.27	0.02	0.13		
178.9	7.56	33.98	26.56	23.3	31.70	0.27	0.74	43.66	2.55	14.15	1.01	14.04	0.03	0.29		

CRUISE W7711A
DATE 10-NOV-77
TIME 1800
STATION 10-6

LONGITUDE 124° 17.0'W
LATITUDE 45° 20.2'N
WIND DIRECTION 165° SPEED 8 kts
CLOUD COVER 7/8 BAROMETRIC PRESSURE 1015.0

SWELL DIRECTION 265° HEIGHT, ft 10 ft
BOTTOM DEPTH, m 170 M
COMMENTS: 11 NM offshore

Depth m	Temp. °C	Salinity ‰	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Phaeophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.66	32.21	24.51	52.4	1.82	0.07	0.45	2.24	0.71	13.87	0.51	26.98	0.65	0.31		
19.8	11.66	32.18	24.49	52.3	1.81	0.06	0.40	2.41	0.67	13.72	1.28	10.69	0.77	0.30		
32.7	11.63	32.21	24.52	54.4	1.85	0.06	0.44	8.56	0.70	11.58	1.08	10.72	0.73	0.24		
53.4	9.22	32.71	25.31	62.2	14.40	0.02	0.49	8.73	1.46	7.63	0.61	12.54	0.10	0.17		
80.0	8.36	33.30	25.90	63.3	21.58	0.05	0.40	22.85	1.87	4.59	0.20	22.79	0.04	0.09		
102.4	8.37	33.60	26.15	52.7	26.75	0.13	0.43	19.22	2.21	8.94	0.48	18.73	0.04	0.14		
123.7	8.31	33.68	26.21	47.9	27.91	0.10	0.54	37.82	2.31	10.57	0.51	20.58	0.02	0.14		
141.8	8.19	33.78	26.31	46.5	29.53	0.10	0.91	37.31	2.42	10.29	0.57	17.99	0.03	0.12		
165.1	7.76	33.92	26.48	35.0	31.53	0.27	0.43	45.95	2.51	8.71	0.48	18.25	0.02	0.17		

CRUISE W7711A
DATE 10-NOV-77
TIME 1930
STATION 10-7

LONGITUDE 124° 14.0'W
LATITUDE 45° 20.0'N
WIND DIRECTION 160° SPEED 8 kts
CLOUD COVER 8/8 BAROMETRIC PRESSURE 1014.1

SWELL DIRECTION 265° HEIGHT, ft 8 ft
BOTTOM DEPTH, m 159 M
COMMENTS: 9 NM offshore

Depth m	Temp. °C	Salinity °/°°	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.69	32.20	24.49	53.4	1.91	0.03	0.47	2.04	0.65				0.56	0.23		
20.9	11.64	32.22	24.52	55.5	1.97	0.09	0.50	0.93	0.65				0.64	0.38		
34.6	11.62	32.22	24.53	56.8	2.19	0.10	0.60	1.34	0.64	9.57	0.90	10.65	0.53	0.27		
54.2	8.73	32.77	25.44	63.1	13.21	0.04	0.56	10.42	1.30	5.40	0.30	18.23	0.08	0.15		
79.0	8.38	33.32	25.92	62.6	21.33	0.03	0.52	12.85	1.80	7.00	0.40	17.60	0.05	0.10		
102.5	8.47	33.51	26.06	36.8	25.37	0.11	0.54	25.10	2.10	10.57	0.58	18.26	0.06	0.32		
123.1	8.42	33.62	26.15	37.2	27.14	0.08	0.53	38.33	2.27				0.03	0.24		
154.5	7.93	33.87	26.42	34.5	28.26	0.43	0.66	38.49	2.50	9.92	0.63	15.74	0.00	0.24		

CRUISE W7711A

DATE 10-NOV-77

TIME 2045

STATION 10-8

LONGITUDE 124° 11.0'W

LATITUDE 45° 20.3'N

WIND DIRECTION 160° SPEED 8 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1013.1

SWELL DIRECTION 265° HEIGHT, ft 9 ft

BOTTOM DEPTH, m 135 M

COMMENTS: 7 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.3	11.69	32.21	24.51	54.1	1.86	0.14	0.58	10.28	0.64				0.55	0.18		
17.5	11.66	32.24	24.53	54.6	2.27	0.11	0.52	7.45	0.64	14.44	1.55	9.30	0.59	0.29		
32.4	11.29	32.52	24.82	59.3	4.49	1.19	0.65	7.29	0.80	37.21	0.37	100.96	0.27	0.16		
52.2	10.29	32.82	25.22	58.4	10.33	1.19	0.41	9.18	1.11	11.66	1.16	10.05	0.12	0.21		
75.4	8.78	33.26	25.81	56.5	21.56	0.28	0.47	9.79	1.76	44.31	0.54	82.72	0.08	0.20		
101.8	8.54	33.54	26.07	35.0	26.45	0.09	0.45	30.05	2.32	19.07	0.94	20.40	0.11	0.50		
126.8	8.17	33.79	26.32	31.9	29.24	0.30	0.46	31.48	2.49	15.15	0.63	23.91	0.05	0.29		

CRUISE W7711A

DATE 10-NOV-77

TIME 2140

STATION 10-9

LONGITUDE 124° 07.9'W

LATITUDE 45° 20.0'N

WIND DIRECTION 140° SPEED 6 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1012.3

SWELL DIRECTION 265° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 106 M

COMMENTS: 5 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.69	32.26	24.54	53.6	2.46	0.17	0.34	4.01	0.71	20.33	2.72	7.47	0.55	0.30		
14.1	11.69	32.23	24.52	53.5	2.49	0.19	0.53	4.09	0.67	12.49	1.05	11.96	0.59	0.28		
22.5	11.61	32.26	24.56	55.8	2.90	0.65	0.50	4.02	0.70	24.74	0.80	30.89	0.51	0.34		
41.6	11.34	32.69	24.95	59.8	4.88	2.41	0.72	4.17	0.91	11.86	0.54	22.15	0.13	0.16		
60.7	10.01	33.07	25.45	54.0	13.73	1.73	0.60	13.88	1.40	9.72	0.78	12.53	0.11	0.22		
81.9	9.25	33.28	25.75	46.3	21.53	0.90	0.56	28.74	1.90	10.72	0.94	11.46	0.12	0.41		
100.8	8.39	33.63	26.16	32.7	27.59	0.22	0.55	39.95	2.32	12.01	1.30	9.25	0.09	0.45		

CRUISE W7711A

DATE 10-NOV-77

TIME 2300

STATION 10-10

LONGITUDE 124° 05.3'W

LATITUDE 45° 20.0'N

WIND DIRECTION 135° SPEED 6 kts

CLOUD COVER 8/8 BAROMETRIC PRESSURE 1012.2

SWELL DIRECTION 265° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 88 M

COMMENTS: 3 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.6	11.63	32.19	24.50	52.4	2.95	0.39	0.62	4.68	0.74	11.06	1.02	10.90	0.51	0.39		
12.8	11.61	32.21	24.52	52.3	2.94	0.61	----	5.15	0.74	12.38	1.19	10.41	0.53	0.40		
23.2	11.55	32.20	24.53	53.3	3.09	0.61	----	4.51	0.78	13.87	1.55	8.93	0.53	0.52		
37.8	11.42	32.60	24.86	44.9	5.60	1.33	0.87	7.81	1.03	17.96	1.15	15.57	0.12	0.33		
52.1	11.17	32.78	25.04	54.0	6.37	2.25	0.87	7.65	1.05	11.58	1.15	10.04	0.10	0.23		
66.2	10.64	32.93	25.25	50.3	9.09	2.42	1.18	11.62	1.24	21.79	0.62	35.40	0.11	0.32		
83.3	8.83	33.44	25.94	30.2	24.15	0.66	0.65	35.75	2.14	13.95	1.08	12.91	0.17	0.60		

CRUISE W7711A

DATE 11-NOV-77

TIME 0015

STATION 11-1

LONGITUDE 24° 01.5'W

LATITUDE 45° 19.9'N

WIND DIRECTION 125° SPEED 7 kts

CLOUD COVER 5/8 BAROMETRIC PRESSURE 1012.0

SWELL DIRECTION 265° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 45 M

COMMENTS: 1 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.17	31.79	24.28	46.0	4.47	1.52	0.84	10.45	0.87	28.86	2.72	10.63	0.25	0.47		
14.0	11.32	31.95	24.37	49.2	4.16	1.59	0.86	9.06	0.83	20.45	2.15	9.52	0.37	0.30		
21.3	11.32	32.04	24.44	49.1	4.18	1.70	0.87	8.36	0.81	12.75	1.32	9.66	0.46	0.26		
27.2	11.35	32.13	24.50	48.8	4.11	1.60	0.83	7.35	0.81	11.46	1.23	9.35	0.63	0.25		
42.1	11.42	32.47	24.76	44.8	5.58	1.96	1.05	9.20	0.83	15.72	1.36	11.56	0.55	0.40		

CRUISE W7711A

DATE 11-NOV-77

TIME 0215

STATION 11-2

LONGITUDE 124° 21.0'W

LATITUDE 45° 20.0'N

WIND DIRECTION 160° SPEED 22 kts

CLOUD COVER 7/8 BAROMETRIC PRESSURE 1010.5

SWELL DIRECTION 265° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 215 M

COMMENTS: Anchor station at 14 NM offshore

Depth m	Temp. °C	Salinity ‰	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.68	32.15	24.46	55.4	2.42	0.23	0.75	4.13	0.73	10.43	1.15	9.05	0.76	0.63		
11.4	11.68	32.18	24.48	55.4	2.43	0.36	0.86	3.70	0.73	17.30	0.89	19.40	0.80	0.56		
26.3	11.68	32.17	24.48	54.7	2.28	0.23	0.84	----	0.70	9.57	0.95	10.08	0.99	0.72		
44.9	10.69	32.24	24.70	58.1			f a	i l e d	t o	c l o s e						
71.2	8.44	33.05	25.70	62.1	4.88	0.20	0.68	6.53	0.83	4.14	0.16	26.8	0.15	0.30		
92.9	7.89	33.41	26.07	62.1	18.19	0.02	0.82	34.52	1.66	10.50	0.79	13.24	0.73	0.61		
135.4	7.97	33.81	26.36	62.7	29.45	0.00	0.62	43.77	2.32	4.78	0.37	12.84	0.05	0.16		
176.1	7.75	33.96	26.52	54.9	31.29	0.00	0.56	45.59	2.51	6.43	0.32	20.22	0.03	0.19		
210.4	7.41	33.99	26.59	41.1	32.54	0.09	0.58	-----	2.59	7.57	0.46	16.48	0.01	0.16		

CRUISE W7711A
DATE 11-NOV-77
TIME 1940
STATION 11-4

LONGITUDE 124° 21.1'W
LATITUDE 45° 20.8'N
WIND DIRECTION 235° SPEED 16 kts
CLOUD COVER 3/8 BAROMETRIC PRESSURE 1010.0

SWELL DIRECTION 200° HEIGHT, ft 10 ft
BOTTOM DEPTH, m 211 M
COMMENTS: Anchor station at 14 NM offshore

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.0	11.64	32.16	24.47	52.8	2.06	0.21	0.47	3.54	0.79	14.15	1.30	10.90	0.02	1.00		
17.2	11.65	32.16	24.47	54.2	2.14	0.16	0.49	4.47	0.83	11.60	1.09	10.67	0.04	1.03		
30.2	11.64	32.16	24.47	54.2	2.05	0.28	0.71	2.96	0.79	11.98	1.08	11.09	0.11	1.03		
50.8	10.35	32.39	24.88	60.7	8.31	1.14	0.56	10.12	1.15	6.57	0.59	11.13	0.01	0.36		
75.4	8.32	33.15	25.79	62.6	20.58	0.13	0.58	22.91	1.82	6.57	0.21	31.46	0.01	0.13		
99.1	8.02	33.52	26.13	63.3	25.78	0.09	0.48	17.53	2.15	7.86	0.26	30.26	0.01	0.10		
147.1	7.99	33.77	26.34	63.3	29.53	0.28	2.47	33.41	2.40	5.08	0.25	20.13	0.01	0.10		
178.7	7.87	33.90	26.45	57.9	31.47	0.09	0.60	22.97	2.45	10.72	0.41	26.00	0.00	0.12		
202.5	7.56	33.95	26.53	23.5	32.21	0.23	0.60	49.11	2.59	18.33	0.73	25.05	0.01	0.31		

CRUISE W7711A

DATE 11-NOV-77

TIME 2130

STATION 11-5

LONGITUDE 124° 21.3'W

LATITUDE 45° 20.9'N

WIND DIRECTION 190° SPEED 16 kts

CLOUD COVER 2/8 BAROMETRIC PRESSURE 1018.2

SWELL DIRECTION 200° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 216 M

COMMENTS: Anchor station at 14 NM

Depth m	Temp. °C	Salinity °/oo	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1.4	11.60	32.17	24.49	54.7	1.79	0.21	0.41	4.06	0.71	10.80	1.01	10.72	0.78	0.21		
19.0	11.61	32.15	24.48	54.6	1.78	0.32	0.47	4.10	0.68	15.01	1.31	11.43	0.80	0.16		
33.5	11.61	32.16	24.48	54.5	1.76	0.16	0.42	4.43	0.67	12.61	1.16	10.87	0.80	0.13		
54.6	9.44	32.54	25.15	62.0	8.96	0.09	0.64	10.62	1.15	9.09	0.72	12.67	0.15	0.19		
75.6	8.06	33.12	25.81	62.4	19.35	0.04	0.54	23.22	1.78	6.14	0.28	21.81	0.06	0.09		
102.9	8.00	33.52	26.13	62.9	25.15	0.11	0.39	30.37	2.11	3.51	0.19	18.75	0.02	0.06		
152.2	7.96	33.81	26.37	63.0	29.47	0.17	0.52	36.18	2.37	5.94	0.18	33.04	0.04	0.08		
176.1	7.85	33.87	26.43	62.1	30.69	0.02	0.66	38.87	2.44	5.85	0.26	22.23	0.01	0.06		
209.0	7.62	33.95	26.53	32.2	32.51	0.16	0.49	45.86	2.58	16.53	0.72	23.04	0.03	0.14		

CRUISE W7711A

DATE 11-NOV-77

TIME 2330

STATION 11-6

LONGITUDE 124° 21.0'W

LATITUDE 45° 20.3'N

WIND DIRECTION 190° SPEED 20 kts

CLOUD COVER 3/8 BAROMETRIC PRESSURE 1018.3

SWELL DIRECTION 200° HEIGHT, ft 8 ft

BOTTOM DEPTH, m 222 M

COMMENTS Anchor station at 14 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.53	32.17	24.50	57.0	1.74	0.25	0.52	3.35	0.68	19.59	1.09	18.01	0.48	0.22		
19.7	11.51	32.17	24.50	56.9	1.58	0.33	0.52	3.35	0.67	14.38	1.08	13.31	0.57	0.44		
33.1	11.52	32.16	24.49	56.9	1.57	0.45	0.50	3.28	0.67	21.22	2.13	9.98	0.57	0.36		
53.5	11.16	32.26	24.64	58.2	2.45	0.15	1.02	3.96	0.71	17.87	2.17	8.24	0.40	0.27		
77.9	8.16	32.83	25.57	62.9	16.59	0.25	0.41	16.33	1.53	63.88	0.70	91.86	0.09	0.16		
100.8	7.92	33.35	26.01	62.7	23.86	0.25	0.42	27.12	1.96	14.29	0.97	14.83	0.05	0.10		
152.8	7.99	33.77	26.33	63.1	30.28	0.25	0.83	36.12	2.34	16.73	0.99	16.84	0.01	0.08		
174.6	7.92	33.86	26.41	62.6	32.25	0.20	0.60	-----	2.43	9.17	0.33	27.60	0.01	0.10		
215.2	7.68	33.90	26.48	35.6	32.94	0.25	0.60	-----	2.62	12.49	0.78	16.11	0.01	0.18		

CRUISE W7711A

DATE 12-NOV-77

TIME 0150

STATION 12-1

LONGITUDE 124° 21.0'W

LATITUDE 45° 19.9'N

WIND DIRECTION 185° SPEED 24 kts

CLOUD COVER 5/8 BAROMETRIC PRESSURE 1018.5

SWELL DIRECTION 185° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 220 M

COMMENTS: Anchor station at 14 NM offshore

Depth m	Temp. °C	Salinity °/..	Sigma t	Transmission %	NO_3NO_2 μM	NH_4^+ μM	Urea μM	SiO_4 μM	PO_4 μM	C μg/L	N μg/L	C/N	Chla μg/L	Pheophyton a μg/L	Irradiance % Sfc	Productivity Potential μg C/L Day
3.0	11.43	32.14	24.50	57.2	1.84	0.35	0.66	4.31	0.72	15.27	1.34	11.44	0.55	0.28		
18.5	11.44	32.14	24.50	56.6	1.92	0.27	0.54	4.12	0.70	39.90	0.71	56.21	0.52	0.15		
33.8	11.44	32.14	24.50	57.0	1.85	0.36	0.56	4.30	0.69	14.90	1.40	10.64	0.50	0.23		
53.6	9.33	32.54	25.17	63.3	8.35	0.46	0.69	9.54	1.15	16.61	0.85	19.59	0.09	0.11		
78.6	8.07	32.91	25.65	62.5	17.92	0.23	0.66	20.25	1.69	16.33	1.03	15.86	0.09	0.11		
103.7	7.96	33.36	26.02	62.2	24.59	0.21	0.54	28.55	2.07	14.61	0.86	16.94	0.07	0.15		
151.9	7.99	33.78	26.34	63.1	29.44	0.14	0.66	32.48	2.36	16.61	0.94	17.63	0.03	0.09		
176.8	8.00	33.87	26.41	59.5	30.97	0.16	0.62	35.86	2.45	13.87	0.87	16.01	0.01	0.11		
215.5	7.74	33.94	26.50	35.5	31.89	0.17	0.73	39.59	2.58	13.55	0.65	21.02	0.03	0.25		

CRUISE W7711A

DATE 12-NOV-77

TIME 0400

STATION 12-2

LONGITUDE 124° 21.2'W

LATITUDE 45° 19.6'N

WIND DIRECTION 180° SPEED 28 kts

CLOUD COVER 7/8 BAROMETRIC PRESSURE 1017.5

SWELL DIRECTION 185° HEIGHT, ft 10 ft

BOTTOM DEPTH, m 233 M

COMMENTS: Anchor station at 14 NM offshore

Depth m	Temp. °C	Salinity °/₀₀	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chl a µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
2.2	11.42	32.13	24.49	55.1	2.06	0.49	0.49	4.81	0.68	12.78	0.90	14.22	0.36	0.31		
19.5	11.43	32.14	24.50	56.0	2.05	0.45	0.46	----	0.65	18.24	1.15	15.82	0.34	0.33		
32.4	11.43	32.14	24.50	56.0	2.10	0.42	0.48	4.50	0.67	15.78	1.56	10.10	0.46	0.37		
53.9	10.75	32.30	24.75	59.9	5.23	0.37	0.43	4.48	0.89	10.32	0.81	12.83	0.15	0.23		
76.3	8.10	32.75	25.52	63.0	12.54	0.46	0.39	4.16	1.31	18.04	1.07	16.81	0.07	0.12		
97.8	7.88	33.30	25.98	61.5	22.01	0.36	0.42	6.82	1.84	13.72	0.89	15.52	0.04	0.10		
158.3	7.96	33.85	26.40	60.9	30.97	0.31	0.45	24.64	2.36	16.44	0.79	20.81	0.02	0.12		
229.9	7.69	34.14	26.67	34.9	32.67	0.36	0.54	40.19	2.54				0.02	0.15		

CRUISE W7711A

DATE 13-NOV-77

TIME 0150

STATION 13-1

LONGITUDE 124° 21.5'W

LATITUDE 45° 20.2'N

WIND DIRECTION 240° SPEED 12 kts

CLOUD COVER 3/8 BAROMETRIC PRESSURE 1018.5

SWELL DIRECTION 200° HEIGHT, ft 12 ft

BOTTOM DEPTH, m 228 M

COMMENTS: Anchor station at 14 NM offshore

Depth m	Temp. °C	Salinity °/••	Sigma t	Transmission %	NO_3NO_2 µM	NH_4^+ µM	Urea µM	SiO_4 µM	PO_4 µM	C µg/L	N µg/L	C/N	Chla µg/L	Pheophyton a µg/L	Irradiance % Sfc	Productivity Potential µg C/L Day
1	11.52	32.18	24.51	56.9	2.72	0.28	0.47	5.54	0.74	8.80	0.92	9.56	0.57	0.26		
20.5	11.54	32.21	24.53	56.3	2.55	0.27	0.36	5.58	0.72	11.86	1.15	10.29	0.67	0.29		
33.5	11.53	32.31	24.61	55.3	2.53	0.33	0.41	5.35	0.75	14.78	1.42	10.40	0.71	0.31		
52.7	11.13	32.70	24.99	57.8	5.30	1.64	0.91	7.85	1.00	21.96	1.56	14.05	0.12	0.30		
75.9	10.31	33.58	25.82	55.9	11.02	2.07	0.83	14.08	1.33	19.33	1.02	18.91	0.10	0.21		
101.1	8.34	33.15	25.79	63.1	17.78	0.17	0.50	22.27	1.61	17.87	1.26	14.16	0.08	0.11		
146.0	8.06	33.67	26.24	63.3	27.48	0.05	0.60	37.35	2.23	12.63	0.83	15.29	0.02	0.06		
177.3	8.02	33.81	26.36	60.1	28.87	0.00	0.70	43.00	2.34	12.09	0.37	32.80	0.01	0.05		
221.1	7.85	33.90	26.45	35.8	29.56	----	0.74	50.65	2.49	16.73	1.30	12.88	0.01	0.16		

CARBON 14 POTENTIAL PRODUCTIVITY

An index of the photosynthetic potential of water samples was obtained by incubating subsamples under uniform environmental conditions and determining the uptake of carbon-14. Samples from all depths were placed in clear or black glass bottles, innoculated with 0.63 μCi of $NaH^{14}CO_3$ in solution, and incubated for three hours in a light chamber filled with running surface sea water. The light field in the barrell shaped incubator and the placement of the bottles results in two constant light levels and a black glass dark sample.

The light source is two 120 watt quartz-iodide lamps inside of a quartz tube located at the verticle axis of the barrell. A black mesh diffuser on the outside of this tube results in a high light level comparable to solar noon values at approximately five meters. The low light level was roughly one-third of the high light. The sample bottles are fastened to slats which mount against the inside surface of the barrell.

During this cruise the surface temperature was roughly 12°C and the minimum in situ temperature from which samples were drawn was 7°C. This amount of thermal change hopefully did not greatly reduce the measured potential productivity. The ratio of high light productivity to low light productivity is reasonably constant and thus indicated that except for the deepest samples the higher light level did not produce light inhibition.

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 6-9

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
300	0.24	0.18	0.24	1.00	0.07
250	0.14	0.04	0.24	0.50	0.10
200	0.21	0.24	0.24		0.03
150	0.31	0.14	0.18	5.00	0.17
100	0.38	0.14	0.31	1.40	0.24
75	1.79	0.08	0.85	2.22	1.72
50	7.04	0.11	2.53	2.86	6.93
25	7.07	0.24	2.30	3.33	6.83
0	6.47	0.28	2.06	3.47	6.19

STATION 7-1

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
350	0.18	0.14	0.08-	0.50	0.03
250	0.24	0.14			0.10
200	0.14	0.11	0.18	0.50	0.03
150	0.24	0.04	0.21	1.20	0.20
100	0.45	0.14	0.24	3.00	0.30
75	1.19	0.14	0.48	3.10	1.04
50	2.26	0.18	1.08	2.30	2.09
25	17.07	0.04	4.82	3.56	17.03
0	15.45-	0.10	5.73	2.67	15.55

STATION 7-2

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
225	0.14	0.08	0.21	0.50	0.07
200	0.28	0.08	0.11	6.00	0.20
150	0.14	0.08	0.08		0.07
100	0.18	0.04	0.21	0.80	0.14
75	0.82	0.21	0.48	2.25	0.61
50	3.27	0.04	0.92	3.69	3.23
25	16.23	0.14	4.99	3.32	16.08
0	14.71	0.18	4.25	3.57	14.54

STATION 7-3

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
175	0.45	0.11	0.48	0.91	0.34
150	0.21	0.11	0.11		0.10
125	0.38	0.08	0.24	1.80	0.30
100	1.05	0.11	0.48	2.55	0.94
75	0.48	0.04	0.24	2.17	0.44
50	1.79	0.11	0.75	2.63	1.68
25	9.36	0.11	2.67	3.62	9.25
0	39.11	0.31	2.26	19.88	38.80

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 7-4

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.53	0.07	0.34	1.73	0.47
125	1.49	0.08	0.45	3.78	1.42
100	1.57	0.11	0.63	2.82	1.47
75	2.40	0.15	0.66	4.41	2.25
50	5.32	0.17	1.64	3.51	5.15
25	16.14	0.13	3.72	4.46	16.02
10	10.53	0.13	2.73	4.00	10.40
0	17.46	0.25	4.11	4.46	17.21

STATION 7-5

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
139	0.54	0.11	0.22	3.82	0.44
125	0.66	0.12	0.33	2.60	0.54
100	1.72	0.09	0.65	2.91	1.63
75	2.54	0.15	0.65	4.79	2.39
50	4.30	0.17	1.36	3.48	4.13
25	18.16	0.19	1.40	14.90	17.97
10	14.52	0.27	3.87	3.96	14.25
0	11.07	0.15	0.70	19.81	10.92

STATION 7-6

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
115		0.02	0.16		
100	1.88	0.06	0.74	2.65	1.82
75	2.37	0.11	0.62	4.45	2.27
50	11.01	0.14	0.95	13.46	10.87
25	13.80	0.21	3.54	4.08	13.59
10	13.87	0.14	3.71	3.85	13.73
0	15.55	0.24	2.83	5.91	15.31

STATION 7-7

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
90	4.62	0.24	1.08	5.20	4.38
75	4.05	0.14	1.72	2.47	3.90
50	4.82	0.11	1.86	2.69	4.71
25	8.08	0.18	2.50	3.41	7.91
20	10.88	0.21	2.19	5.37	10.67
15	10.77	0.28	2.36	5.03	10.50
10	10.47	0.21	1.79	6.49	10.26
5	10.84	0.14	2.97	3.79	10.70

STATION 7-8

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
63	7.04	0.28	2.23	3.47	6.76
50	4.76	0.15	1.93	2.59	4.61
25	6.75	0.13	1.71	4.19	6.63
10	8.56	0.09	1.45	6.22	8.48
0	10.41	0.17	2.25	4.93	10.24

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 7-9

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.51	0.13	0.36	1.68	0.39
100	0.16	0.08	0.61	0.16	0.08
75	1.70	0.02	0.63	2.78	1.68
50	1.63	0.15	0.87	2.06	1.48
30	8.93	0.16	2.84	3.27	8.77
20		0.10	2.74		
10	7.50	0.20	2.78	2.83	7.30
0	8.78	0.20	2.43	3.86	8.58

STATION 7-10

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.41	0.11	0.15	7.25	0.30
100	0.88	0.08	0.62	1.48	0.80
75	1.98	0.13	0.93	2.31	1.85
50	9.70	0.18	2.26	4.58	9.52
30	8.68	0.18			8.50
20	9.06	0.20	2.43	3.98	8.86
10	9.97	0.21	1.63	6.90	9.76
0	6.85	0.22	2.96	2.42	6.63

STATION 8-1

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.20	0.11	0.17	1.50	0.09
100	1.12	0.11	0.32	4.85	1.01
75	0.86	0.08	0.55	1.63	0.78
50	2.38	0.11	0.59	4.76	2.28
30	11.69	0.20	2.90	4.25	11.49
20	6.48	0.23	1.96	3.62	6.25
10	11.60	0.14	2.83	4.26	11.46
0	12.04	0.28	2.69	4.89	11.75

STATION 8-2

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.28	0.07	0.09		0.22
100	1.20	0.11	0.50	2.76	1.09
75	1.57	0.04	0.55	3.00	1.53
50	1.72	0.08	0.87	2.08	1.64
30	15.39	0.17	2.99	5.40	15.23
20	11.85	0.15	3.11	3.95	11.70
10	16.33	0.19	3.21	5.35	16.14
0	16.16	0.15	3.64	4.58	16.02

STATION 8-3

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.34	0.13	0.12		0.21
100	1.18	0.09	0.42	3.28	1.09
75	1.33	0.08	0.55	2.63	1.26
50		0.07	0.77		
30	11.36	0.14	3.20	3.67	11.22
20	16.06	0.21	3.90	4.29	15.85
10	16.24	0.14	3.54	4.73	16.10
0	17.41	0.14	4.53	3.94	17.28

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 8-4

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.39	0.08	0.19	2.73	0.31
100	1.56	0.07	0.61	2.77	1.50
75	1.19	0.15	0.84	1.52	1.04
50	1.42	0.04	0.65	2.28	1.37
30	9.86	0.08			9.79
20	19.95	0.21	3.87	5.39	19.74
10	20.37	0.09	4.42	4.68	20.28
0	16.94	0.08	3.85	4.47	16.87

STATION 8-5

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.32	0.09	0.18	2.45	0.23
100	1.14	0.16	0.48	3.03	0.98
75	1.42	0.18			1.24
50	1.97	0.06	0.82	2.49	1.91
30	16.00	0.18	3.89	4.26	15.82
20	17.13	0.04	0.98	18.26	17.09
10	17.03	0.13	4.65	3.74	16.90
0	18.31	0.15	4.58	4.10	18.16

STATION 8-6

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.27	0.15	0.10-	2.40	0.13
100	0.46-	0.02	0.20	2.19	0.48
75	1.92-	0.01	0.47	4.02	1.92
50		0.11	0.63		
30	11.20	0.11	2.45	4.74	11.10
20	18.63	0.12	3.34	5.74	18.51
10	23.30	0.16	3.96	6.10	23.14
0	19.21	1.12	4.95	4.72	18.10

STATION 8-7

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.39	0.10	0.18	3.50	0.29
100	1.08	0.13	0.45	2.97	0.96
75	0.54	0.07	0.33	1.84	0.48
50	1.28	0.14	0.41	4.23	1.14
30	13.70	0.20	3.63	3.93	13.50
20		0.19			
10	8.17	0.24	3.02	2.85	7.93
0	10.76	0.18	2.83	3.99	10.58

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 8-8

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.38	0.10	0.23	2.08	0.28
100	1.69	0.08	0.66	2.77	1.61
75	1.99	0.08	0.63	3.47	1.91
50	1.67	0.13	0.67	2.85	1.54
30	13.90	0.10	3.11	4.58	13.80
20	16.40	0.24	1.12	18.50	16.16
10	13.14	0.21	2.95	4.73	12.93
0	11.20	0.21	1.19	11.25	10.99

STATION 8-9

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.28	0.08	0.23	1.33	0.21
100	0.54	0.12	0.27	2.73	0.43
75	1.40	0.14	0.69	2.28	1.26
50	0.90	0.12	0.53	1.88	0.78
30	7.45	0.17	3.18	2.42	7.28
20	10.33	0.21	3.13	3.46	10.12
10	12.13	0.23	3.28	3.91	11.90
0		0.11	2.70		

STATION 8-10

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.39	0.14	0.28	1.72	0.25
100	0.44	0.12	0.35	1.41	0.32
75	1.24	0.11	0.54	2.60	1.13
50	1.03	0.08	0.54	2.05	0.96
30	10.45	0.16	4.00	2.68	10.30
10	15.04	0.38	3.59	4.56	14.66
0	12.07	0.19	2.32	5.57	11.88

STATION 8-11

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
150	0.40	0.08	0.24	1.94	0.32
100	0.23	0.11	0.14	4.00	0.13
75	0.89	0.18	0.38	3.58	0.71
50	1.07	0.14	0.59	2.09	0.94
30	9.21	0.24	3.03	3.22	8.97
20	10.89	0.25	4.81	2.34	10.64
10	12.97	0.32	4.24	3.23	12.66
0	11.33	0.22	3.18	3.76	11.11

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 8-12

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	1.54	0.10	0.80	2.05	1.45
30	11.13	0.19	3.40	3.41	10.94
20	9.63	0.19	3.65	2.73	9.44
10	16.89	0.28	4.60	3.85	16.61
0	15.16	0.20	5.23	2.97	14.96

STATION 9-1

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	0.38	0.12	0.86	0.35	0.26
30	8.01	0.21	2.46	3.47	7.80
20	8.59	0.18	3.12	2.86	8.41
10	6.23	0.19	4.14	1.53	6.04
0	10.90	0.24	4.88	2.30	10.66

STATION 9-2

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	8.18	0.10	2.45	3.44	8.08
30	12.46	0.23	4.92	2.61	12.23
20	13.53	0.25	5.42	2.57	13.28
10	11.32	0.25	5.08	2.29	11.07
0	10.76	0.10	5.00	2.18	10.66

STATION 9-3

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	6.41	0.14	2.68	2.47	6.27
30	16.77	0.20	5.89	2.91	16.57
20	8.92	0.07	3.53	2.56	8.85
10	20.99	0.21	3.88	5.66	20.78
0	11.39	0.21	9.83	1.16	11.18

STATION 9-4

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	0.53	0.09	0.80	0.62	0.45
30	5.67	0.15	2.48	2.37	5.52
20	11.11	0.10	2.31	4.97	11.01
10	10.12	0.15	6.74	1.51	9.97
0	22.52	0.11	6.84	3.33	22.41

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 9-5

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
40	4.52	0.14	0.93	5.54	4.38
30	5.79	0.20	2.24	2.74	5.59
20	13.15	0.41	4.17	3.38	12.74
10	14.09	0.17	3.25	4.52	13.93
0	8.55	0.16	4.16	2.10	8.39

STATION 9-6

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	2.83	0.14	1.12	2.76	2.69
40	13.93	0.28			13.65
30	11.96	0.23	2.64	4.86	11.73
15	13.66	0.35	3.52	4.20	13.31
0	14.54	0.22	3.05	5.06	14.32

STATION 9-7

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	3.24	0.24	0.92	4.43	3.00
40	4.66	0.10	1.04	4.83	4.57
30	13.53	0.24	4.17	3.38	13.29
15	14.60	0.18	3.48	4.38	14.43
0	17.15	0.54			16.61

STATION 9-8

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
30	4.20	0.30	3.22	1.34	3.90
15	15.18	0.34	6.33	2.48	14.84
0	17.11	0.29	5.58	3.18	16.82

STATION 9-9

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
30	11.17	0.24	5.37	2.13	10.93
10	10.33	0.24	4.55	2.34	10.09
0	12.29	0.14	6.09	2.04	12.15

STATION 9-10

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
30	10.07	0.32	4.78	2.19	9.76
20	8.98	0.24	4.19	2.21	8.74
10	9.60	0.36	4.14	2.44	9.25
0	9.97	0.21	4.07	2.53	9.76

C-14 POTENTIAL PRODUCTIVITY IN UG C/L/HR

CRUISE W7711A

STATION 11-4

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	6.06	0.16	0.90	7.99	5.90
30	5.93	0.14	2.96	2.06	5.79
15	7.82	0.15			7.68
0	9.47	0.29	3.89	2.55	9.17

STATION 11-5

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	1.84	0.13	1.16	1.67	1.72
30	8.58	0.30	3.75	2.41	8.28
15	8.53	0.21	4.59	1.90	8.32
0	12.03	0.25	3.78	3.34	11.77

STATION 11-6

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	4.52	0.07			4.45
30	4.81	0.11	2.42	2.04	4.70
15	5.31	0.13	2.21	2.49	5.18
0	5.26	0.19	3.20	1.69	5.07

STATION 12-1

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	0.63	0.09	0.79	0.77	0.54
30	6.57	0.19	3.09	2.20	6.38
15		0.11	2.55		
0		0.18	3.23		

STATION 12-2

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
50	2.77	0.21	1.31	2.32	2.56
30	9.95	0.12	3.81	2.66	9.83
15	11.29	0.19	4.81	2.40	11.10
0	11.65	0.21	4.36	2.76	11.44

STATION 13-1

DEPTH	HI LT	DARK	LO LT	HI/LO	HI-DK
212	0.23-	0.03	0.17	1.32	0.26
175	0.20	0.12	0.18	1.33	0.08
150	0.21	0.13	0.23	0.80	0.08
100	0.60	0.26	0.29		0.33
75	1.08	0.06	0.69	1.62	1.03
50	2.47	0.15	1.05	2.56	2.32
30	9.61	0.14	4.37	2.24	9.48
15	11.40	0.25	5.06	2.32	11.15
0	11.49	0.18	5.86	1.99	11.32

END OF DATA

ZOOPLANKTON DATA

ZOOPLANKTON BIOMASS

Methods

Samples were taken with a 0.5 m net (239 μm mesh) towed vertically from 100 m to the surface at the slowest speed for the hydrowire on the WECOMA. A 250 pound weight kept the wire angle nearly vertical except during very high winds.

The entire sample was diluted to 500 ml, stirred the mix randomly, and the top 100 ml was poured out. This aliquot was put through a screen (73 μm) and scraped into an aluminum weighing pan, and dried at 60°C. Replicates for biomass showed relatively small variations:

	Replicate 1	Replicate 2 mg/m^3
Sample 8-4, Anchor 1, 0600	3.7	6.7
Sample 12-1, Anchor 2, 0200	13.2	10.5

Results

Graphs 1 and 2 show zooplankton biomass along three transects and at two anchor stations, respectively. Tables 1 and 2 show the zooplankton biomass data for three transects and at two anchor stations. Confidence intervals (65%) were calculated for the two anchor stations.

	Anchor 1	Anchor 2	
Mean	18.0	12.5	mg/m^3
Standard deviation	9.2	5.7	mg/m^3
Degrees of freedom	17	7	
95% confidence interval	13.4-22.6	7.7-17.3	mg/m^3

The zooplankton biomass increases nearshore (in the first five n.m. offshore), and these increases are well above the variations observed at Anchor Stations 1 and 2, 10 and 15 n.m. offshore, respectively.

TABLE 1. ZOOPLANKTON BIOMASS FOR THREE TRANSECTS ALONG 45°20'N.

Transect 1, November 7, 1977

Sample	Nautical miles offshore	Zooplankton biomass, mg/m^3
7-1	15	32.2 * net towed
7-2	13	14.4
7-3	11	19.0
7-4	9	10.4
7-5	7	16.9
7-6	5	32.3
7-7	3	230.1
7-8	1	60.9

Transect 2, November 9 and 10, 1977

Sample	Nautical miles offshore	Zooplankton biomass, mg/m^3
9-5	1	145.8
9-6	3	48.6
9-7	5	70.1
9-8	7	21.3
9-9	9	16.0
9-10	11	10.0
10-1	13	27.1
10-2	15	14.0
10-3	20	7.4

Transect 3, November 10 and 11, 1977

Sample	Nautical miles offshore	Zooplankton biomass, mg/m^3
10-4	15	6.8
10-5	13	15.2
10-6	11	13.5
10-7	9	9.0
10-8	7	12.0
10-9	5	13.0
10-10	3	23.8

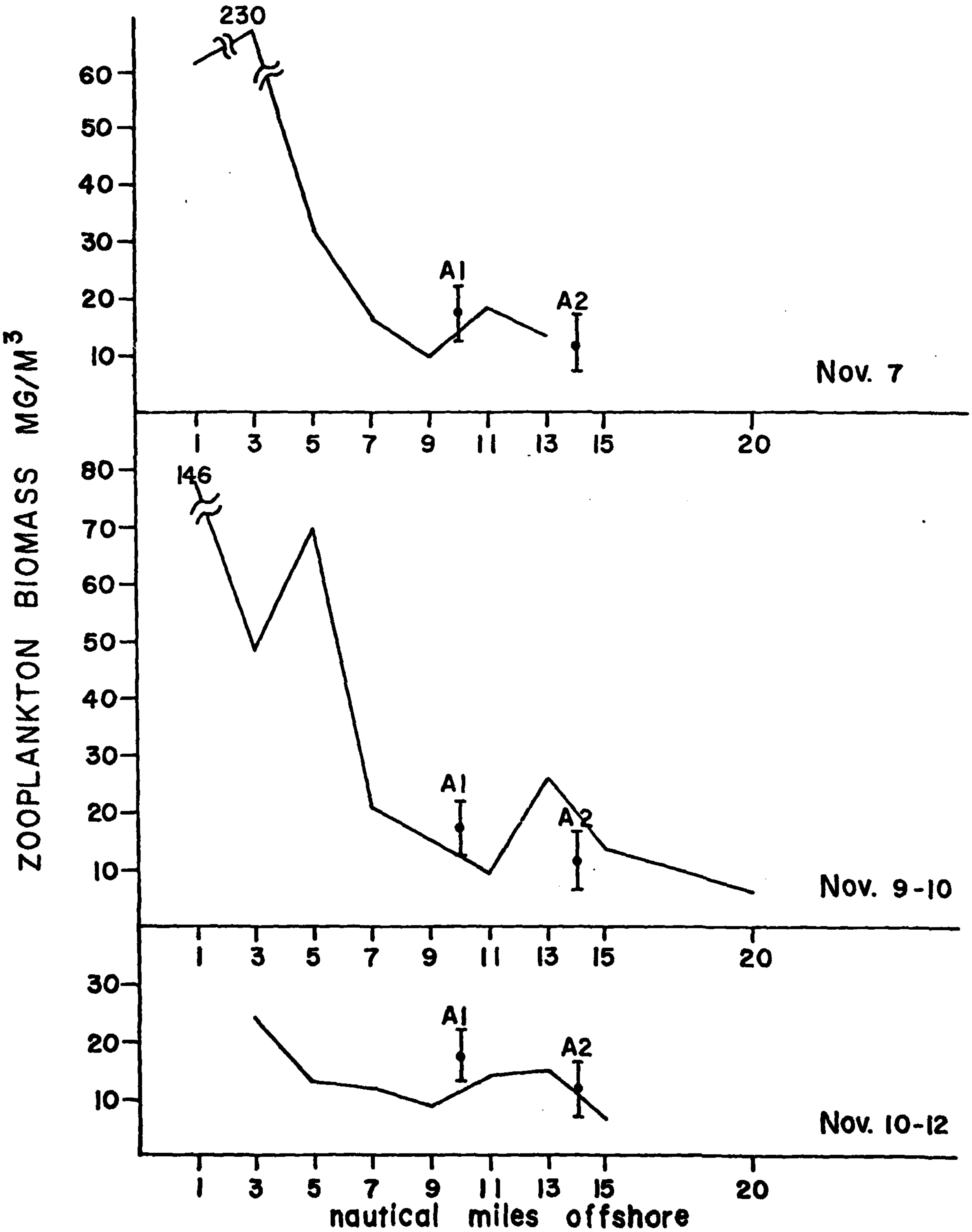
TABLE 2. ZOOPLANKTON BIOMASS FOR TWO ANCHOR STATIONS ALONG TRANSECT 45°20'N

Anchor 1, November 8, 1977, 10 nautical miles offshore

Sample	Time of Sample	Zooplankton biomass, mg/m^3
7-9	2000	25.6
7-10	2200	4.2
8-1	0000	17.6
8-2	0200	17.5
8-3	0400	23.2
8-4	0600	3.7
8-5	0800	7.8
8-6	1000	31.0
8-7	1200	19.5
8-8	1400	31.4
8-9	1600	12.4
8-10	1800	19.4
8-11	2000	11.4
8-12	2200	34.5
9-1	0000	20.6
9-2	0200	15.0
9-3	0400	7.3
9-4	0600	21.7
8-4 replicate	0600	6.7

Anchor 2, November 11, 12, and 13, 1977, 15 nautical miles offshore

Sample	Time of sample	Zooplankton biomass, mg/m^3
11-2	0130	17.6
11-3	0330	19.9
11-4	1930	10.6
11-5	2130	5.5
11-6	2330	8.5
12-1	0200	13.2
12-2	0400	18.5
13-1	0200	6.0
12-1 replicate	0200	10.5 Total
12-1		2.2 Pyrasoma
12-1		2.5 Euphausiids
12-1		1.5 Misc. jellies
12-1		4.3 Zooplankton and fecal pellets



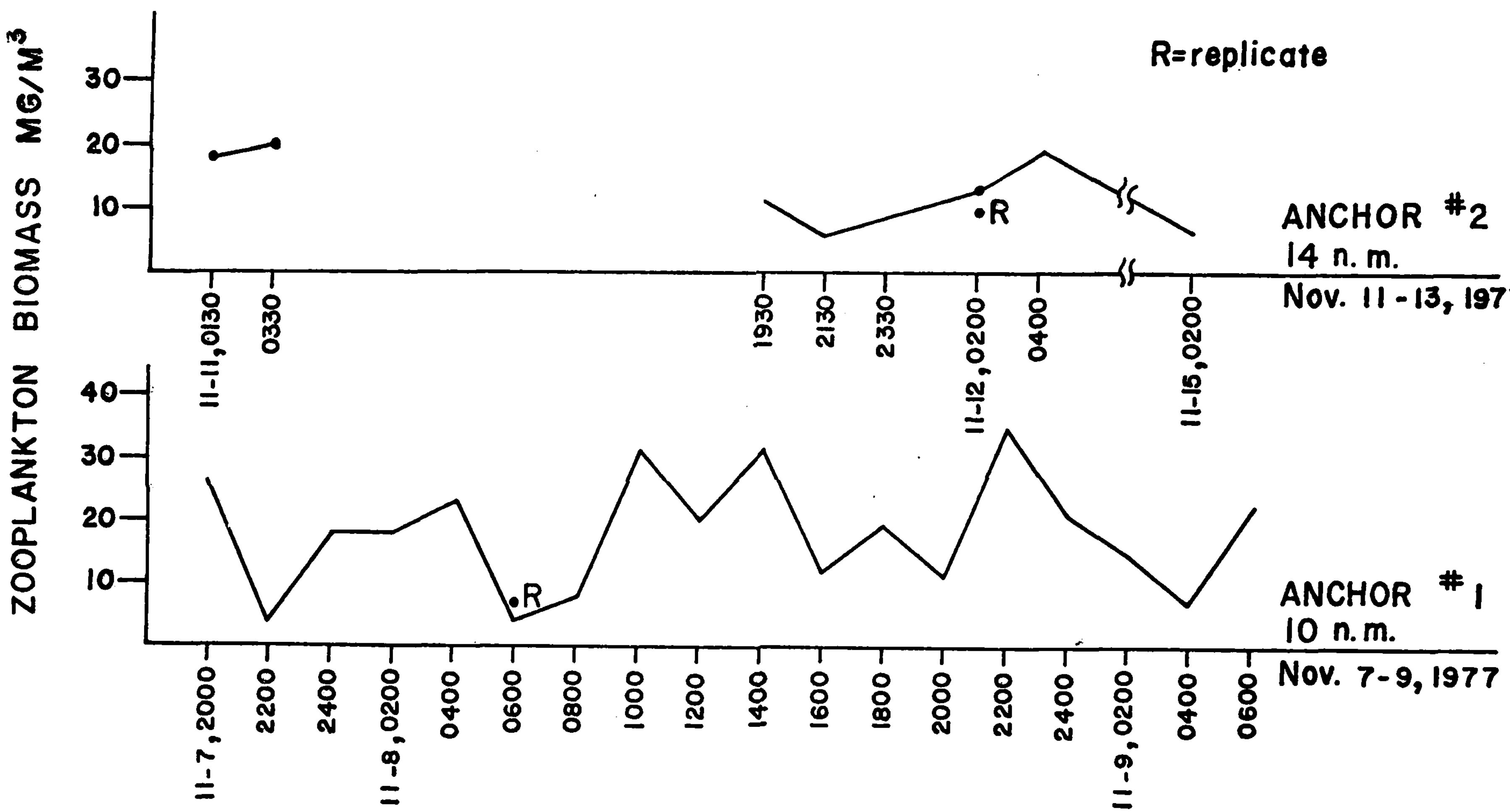
CAPE LOOKOUT TRANSECT, 45° 20°N

A1 = ANCHOR STATION 1

A2 = ANCHOR STATION 2

I = 95% CONFIDENCE INTERVALS

CAPE LOOKOUT TRANSECT, 45° 20° N



ZOOPLANKTON SPECIES ENUMERATION

This report summarizes the results of microscope analysis of preserved zooplankton samples collected on 7 November 1977 along the 45°20'N transect line off Cape Lookout, Oregon. A considerable amount of zooplankton sampling has been done off Oregon, particularly off Newport, so the seasonal cycle of zooplankton species composition and abundance is well known. Results of these earlier studies are published and readily available (e.g., Peterson and Miller, 1976, 1977). The November 1977 samples will be discussed in light of our previous work off Newport.

General Remarks

There is a strong seasonal cycle in continental shelf circulation and in the occurrence of water types, off Oregon. During spring and summer months, net flow is southward beginning in March and April. During fall and winter, flow is northward, usually beginning in October-November. Subarctic water is present over most of the shelf during the summer. A different water mass appears in the fall. It seems to be a mixture of surface water normally found more offshore during the summer, and water found well to the south of Oregon.

Such a seasonal cycle in circulation and water masses markedly affects zooplankton species distributions. Since zooplankton drift more or less passively with the currents, their presence or absence at a given location can indicate the presence or absence of a certain water mass at that point. Zooplankton species can act as excellent tracers, or indicators of water types if such species are known to have a strong affinity for only one water type. Fortunately, over the years, a lot of sampling has been done at many points along the west coast of North America which has led to a

good understanding of zooplankton distributions. Therefore, a large number of indicator species are known. The indicator species concept will be used in this report.

Results

Preserved zooplankton samples were taken at stations 2,3,5,7,9,11,13 and 15 miles from shore with a 1/2 m diameter net that was hauled vertically through the upper 100 m of the water column, depth permitting. I counted one 1-ml aliquot each from the 2,5,9, and 15 mile samples. Using appropriate conversion factors, enumeration data were reduced to number of individuals per m^3 of water filtered, a standard convention.

TOTAL ZOOPLANKTON ABUNDANCE. The abundance of all taxa pooled is shown below. As in the usual case off Oregon, copepods dominated, making up an average of 84% of the total numbers.

Station	2	5	9	15
Total Zooplankton (no. $\cdot m^{-3}$)	16,868.0	7414.8	1412.1	2772.3
Total Copepods (no. $\cdot m^{-3}$)	15,134.0	6246.0	1242.8	2350.5
Percent Copepods	84.8	82.9	86.4	82.0

Compared to November 1969, 1970 and 1971, total catch in 1977 was very high at the two nearshore stations and above averaged at both offshore stations. Total abundance nearshore was as high in October 1970 so values seen in 1977 are not extraordinary.

OCCURRENCE OF COPEPOD SPECIES. All copepod species which commonly occur off Oregon during fall and winter months were present in the November 1977 samples. This indicates that typical "winter water" was present over the

shelf. The prinicipal indicator species are *Calanus pacificus* (offshore during the upwelling season), *Acartia longiremis* (outer shelf during upwelling), and the southern species *Clausocalanus arcuicornis, C. pergens, Ctenocalanus vanus* and *Coryacaeus anglicus*. The latter four are visiting us from San Diego.

Based on both zooplankton species occurrence and abundance, animals were placed into one of three groups in Table 1. These groups are (1) a nearshore group (greatest abundance at the 2 and 5 mile station), (2) an offshore group (abundant at the 9 and/or 15 mile stations) and (3) a group containing animals with no clear affinity. All copepods listed among the nearshore group, with the exception of *Calanus pacificus*, are neritic species. Most of the offshore copepods are found well offshore during the upwelling season.

Summary

1. November 1977 was like previous Novembers. Zooplankton having offshore and southern affinities were the dominant forms. Therefore, the water was not of subarctic origin but instead from offshore and to the south.
2. Two distinct groups of zooplankton were found over the shelf, an inshore and offshore group. Based on these groupings, I would expect hydrography and optical properties of the water to be stikingly different between the nearshore and offshore stations.

NEARSHORE ASSEMBLAGE	2	5	9	15
Copepods				
Calanus pacificus	3149.0	712.5	18.9	30.1
Paracalanus parvus	4982.0	2564.9	178.9	557.4
Centropages abdominalis	188.0			
Epilabidocera amphitrites	141.0			
Acartia loniremis	3995.0	1448.6	47.1	75.4
A. clausii	235.0			
Tortanus discaudatus	282.0	23.8	9.4	
Corycaeus anglicus	987.0	308.0		
Other Zooplankton				
Cladocerans (*Podon* spp)	1081.0			
Chaetognaths	188.0	71.3		30.1
OFFSHORE ASSEMBLAGE				
Copepods				
Calanus tenuicornis		23.8	37.6	45.3
Calocalanus tenuis				15.1
C. styliremis				15.1
Clausocalanus pergens	47.0	23.8	56.5	150.6
Aetideus pacificus				15.1
Scolecithricella minor				36.2
Metridia sp		47.5	65.9	150.6
Lucicutia flavicornis				15.1
Candacia columbiae			18.9	
Oithona spinirostris			9.4	120.5
UNCERTAIN RELATIONSHIPS				
Copepods				
Eucalanus bungi		213.8	18.9	
Pseudocalanus sp	423.0	617.5	611.9	527.3
Clausocalanus arcuicornis	141.0	142.5	47.1	271.1
Ctenocalanus vanus	47.0	71.3	47.1	45.2
Oithona similis	517.0	47.5	75.3	256.0
Other Zooplankton				
Larvacea (*Oikopleura* spp)	235.0	237.5	56.5	165.8

References

Peterson, William and Charles Miller. 1976. Zooplankton along the continental shelf off Newport, Oregon, 1969-1972: distribution, abundance, seasonal cycle and year-to-year variations. Oregon State University Sea Grant Coll. Prog. Publ. ORESU-T-76-002, 111 pp.

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